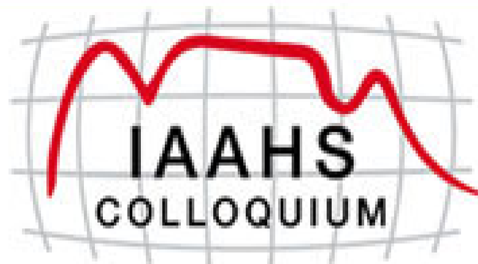


International Actuarial Association Health Section
2007 Colloquium
13th - 16th May 2007 Cape Town, South Africa

The Role of Risk Equalisation in Social and National Health Insurance

Professor Heather McLeod

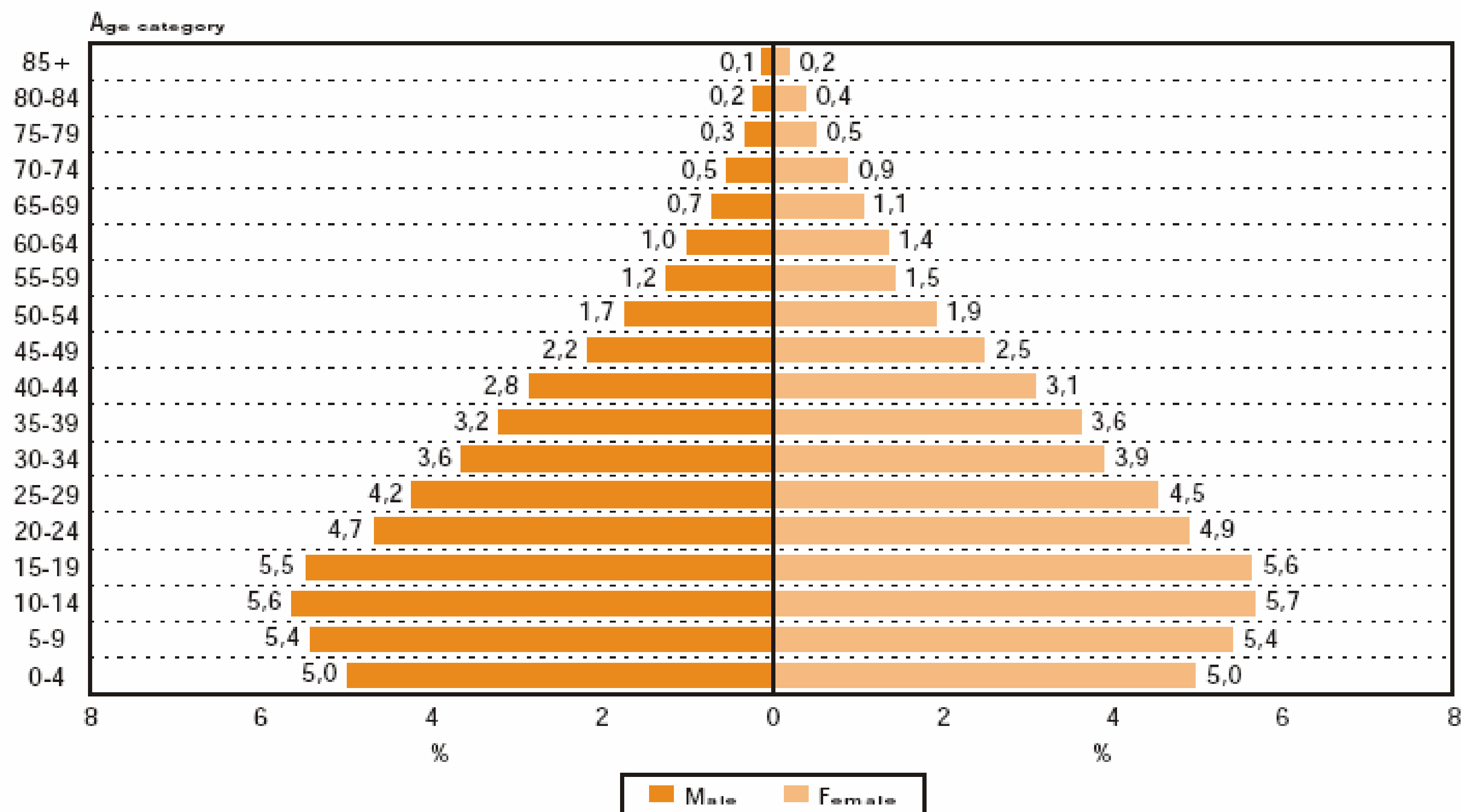
Tuesday 15 May 2007

Agenda

- Transformation to Social Health Insurance
- Risk-Adjusted Cross-Subsidies
- Income Cross-Subsidies
- Moving from Voluntary to Mandatory Cover
- Impact of Chronic Disease on the Price of Healthcare
- Risk Equalisation using Chronic Disease
- Prevalence of Common Chronic Diseases

Transformation to Social Health Insurance

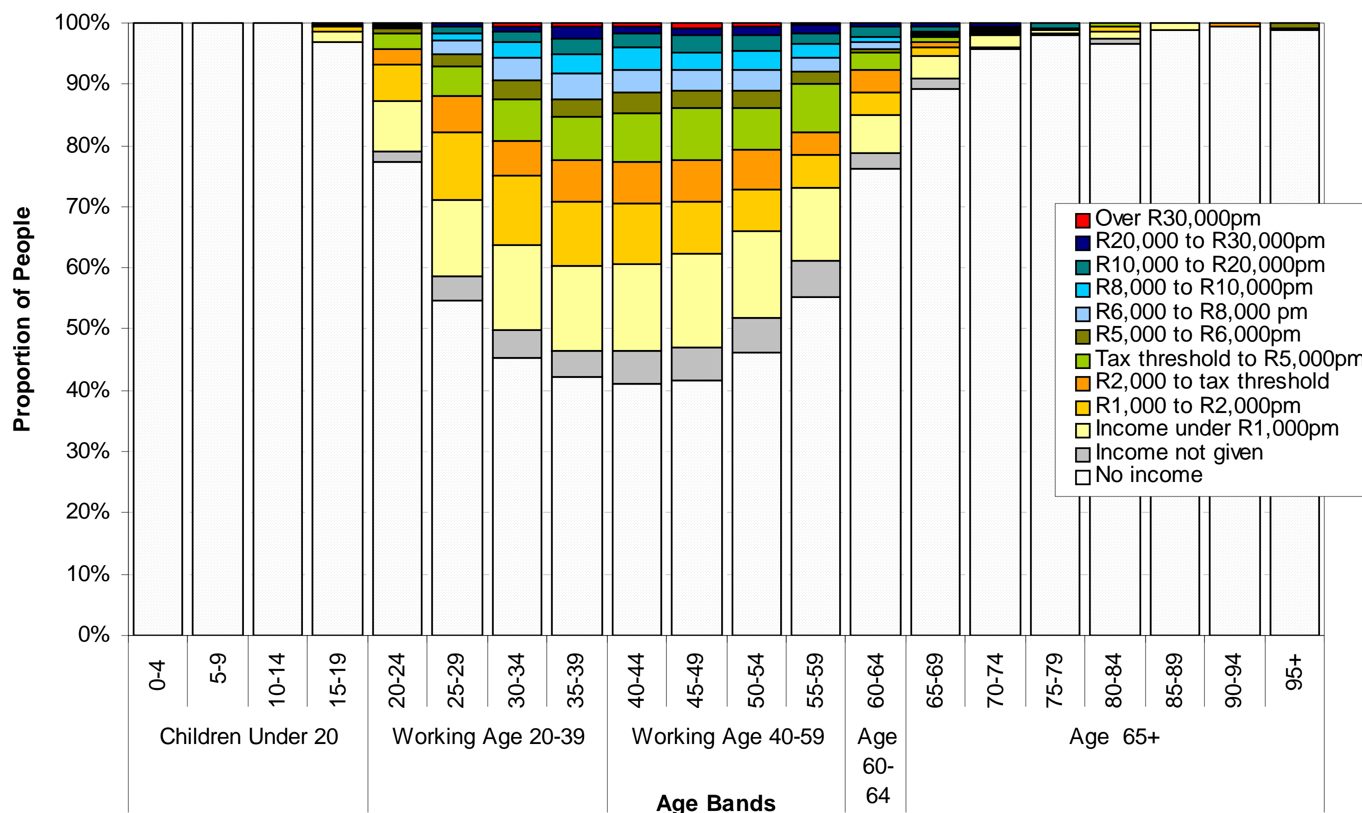
South African Population Pyramid



Total population mid-2006 estimated to be 47.4 million people.
42.6% are under age 20 and 61.5% are under age 30.
Only 5.0% of the population are over age 65.

Source: StatsSA Census 2001 and mid-year 2006 population estimate

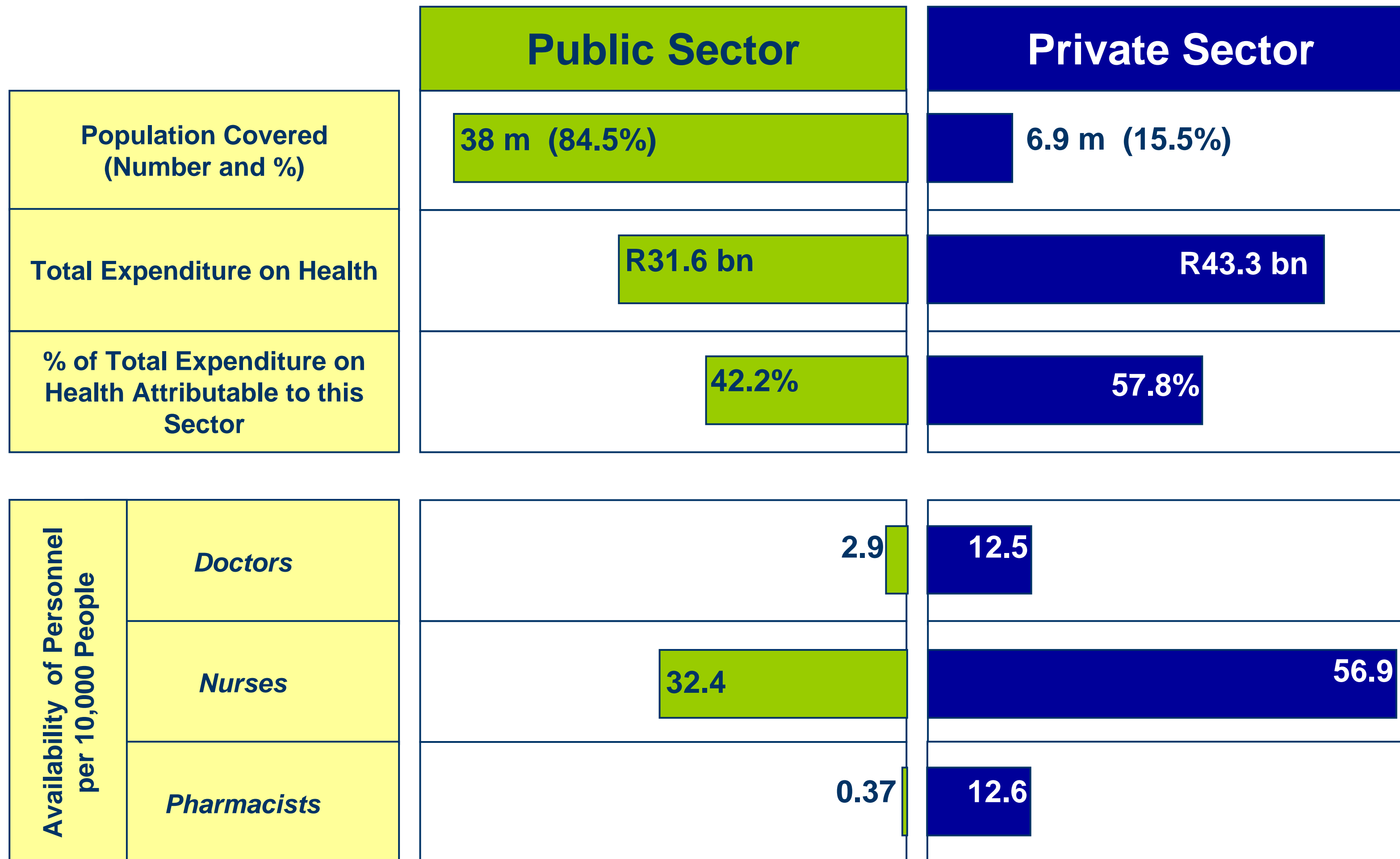
Individual Income in South Africa



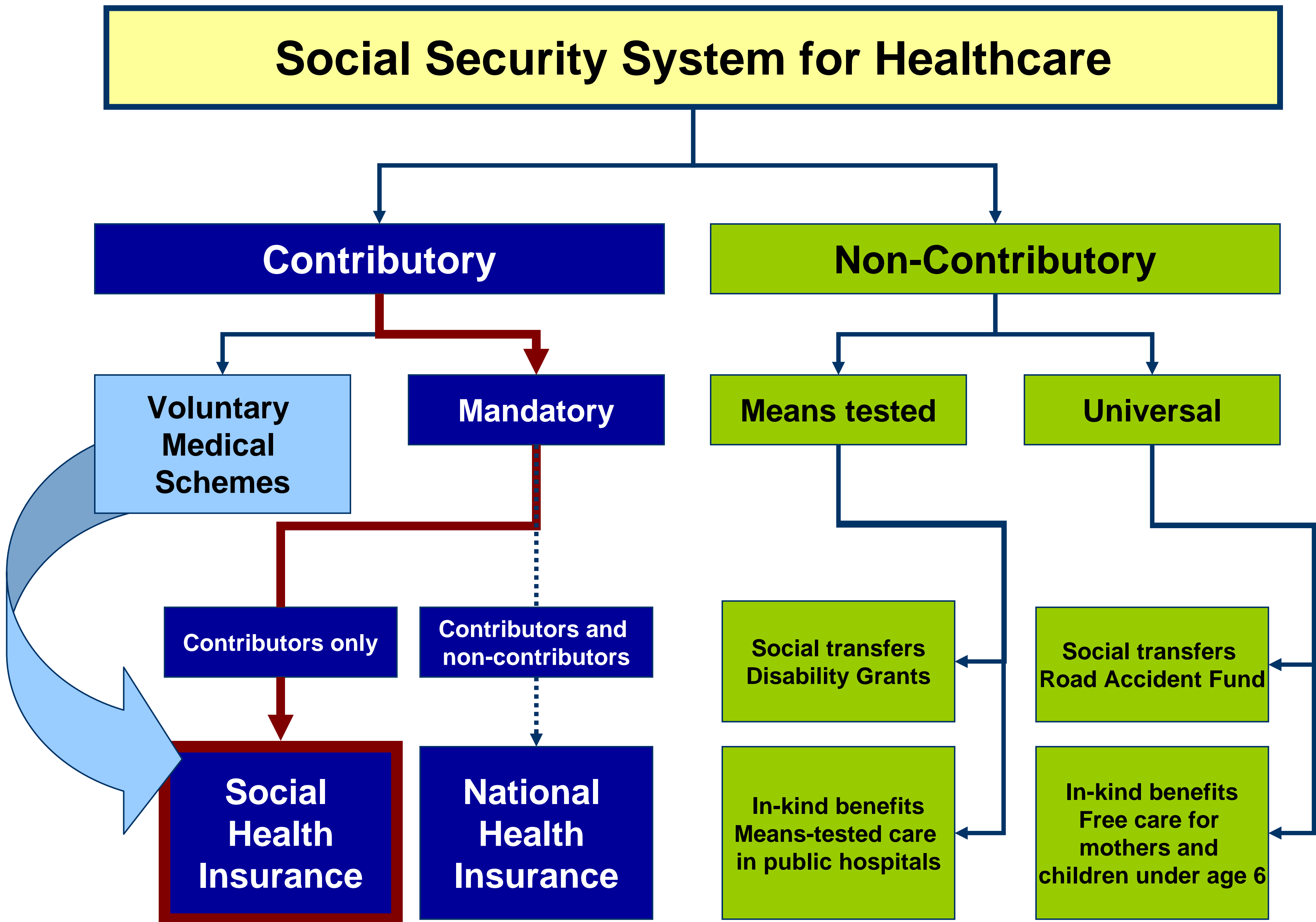
75.4% of the population do not earn any income.
40.3% live in a household where there is no-one who earns an income.
54.0% of the working age population do not earn any income.

Source: Extracted for DoSD using EPRI GHS 2005 data

Healthcare Inequality in SA



Source : ABSA Healthcare 2004



Source : adapted from Social Security Committee Report 2002 (Taylor Committee)

Early History of Health Cover in SA

- First "medical scheme": De Beers Consolidated Mines Ltd. Benefit Society, established 1889. By 1910 seven schemes and by beginning of WWII 48 medical schemes.
- WHO: "A scheme for a national health service broadly similar to the British model was proposed in South Africa in 1944, comprising free health care and a network of community centres and general practitioners as part of a referral system, but was not implemented."
- By 1960, 169 schemes covering nearly 1 million people – "urban, middle-class white population". Coverage 80% of "eligible whites."
- First Medical Schemes Act in 1967 ensured schemes were run on the basis of **solidarity** principles.
- By 1980, too many medical schemes with inadequate spread of risk. But pressure for more flexibility and less regulation. "Prevention of a "socialised health system" became a recurrent theme.
- Insurers became significantly involved in healthcare in early 1990s.

Sources: World Health Organization and Department of Health

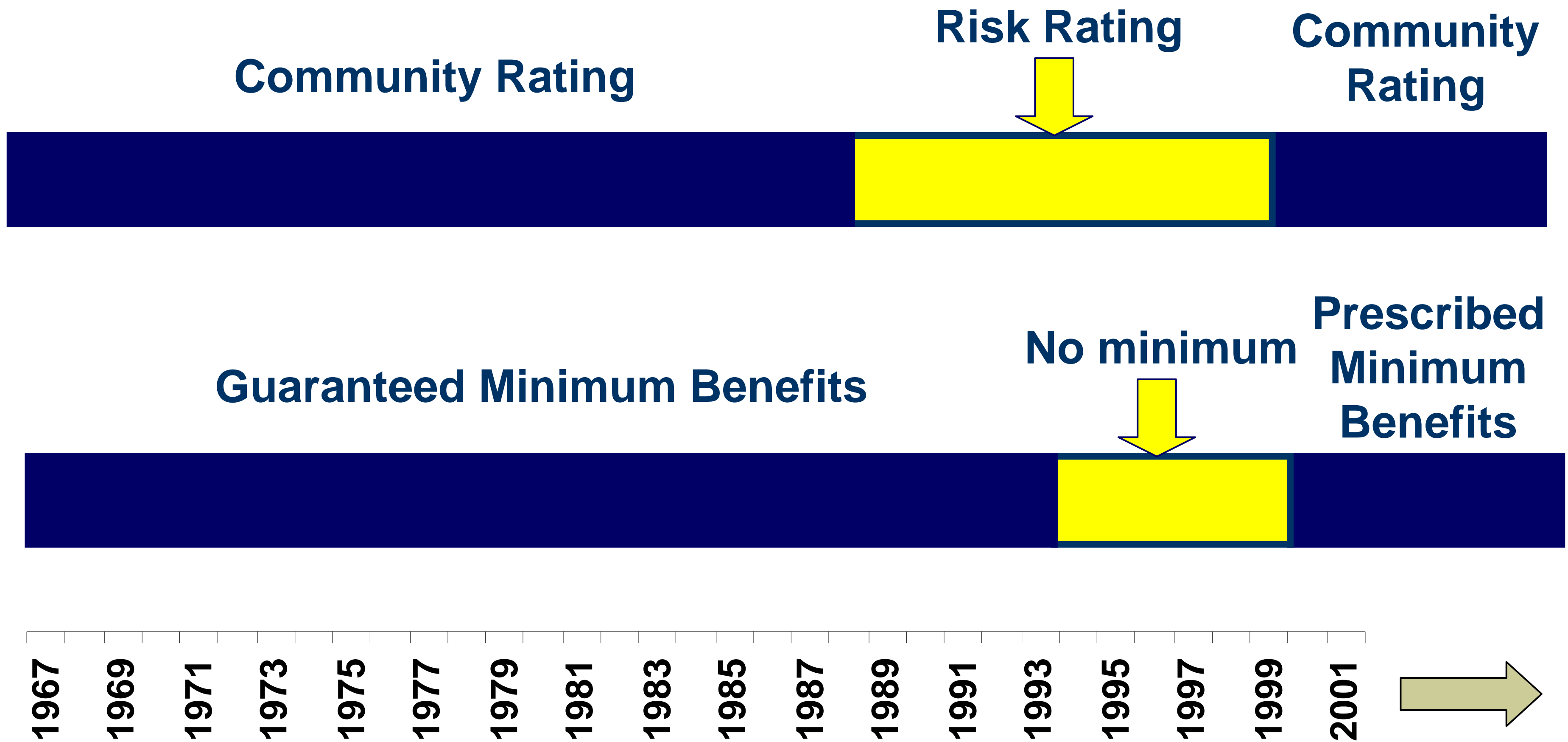
Mutuality and Solidarity

- **Mutuality:** is the normal form of commercial insurance… Applicants contribute to the pool through a premium that relates to their particular risk at the time of the application, ... The pooled funds then pay those insured who suffer losses in accordance with the scale of their losses …or in accordance with the agreed sum assured... A private commercial insurance market requires mutuality.

- **Solidarity:** is a concept that has some similarity to mutuality, but also a profound difference. The similarity is that losses are paid according to need, and the difference is that contributions are made not in accordance with the risks that each applicant brings .., but perhaps according to ability to pay, or just equally. Social security, social insurance or national insurance … some measure of universality and some measure of compulsion.

Source: David Wilkie, *Mutuality and Solidarity: Assessing Risks and Sharing Losses*

Solidarity - Mutuality - Solidarity



A significant return to solidarity principles from 1 January 2000.

Solidarity - Mutuality - Solidarity

- DoH: “The history of the medical schemes movement and its regulation shows a drift from solidarity principles which defined the original schemes, to individualising health cover.”
- “By 1999 no open scheme was permitting anyone over the age of 55 to join as an individual member.” “Life-time exclusions for pre-existing conditions, and age-rating and/or experience rating of members.”
- “.. vulnerable groups excluded from cover (old and those with chronic conditions); medical costs continued to rise (due to retention of fee-for-service reimbursement); non-medical costs driven up (profit-taking and hidden commission costs).”
- The Melamet Commission reported in the last month of the apartheid government. Further deregulation recommended: “insurance products represented the best way of providing health cover”.
- Rejected by newly-elected democratic Government, replaced by strategic direction from 1995 National Health Insurance Committee of Inquiry: **Social Health Insurance** under solidarity principles.

National Health Act, 2003

- … recognising the socio-economic injustices, imbalances and inequities of health services of the past
- …the right of everyone of access to health services
- …reasonable measures, within available resources to achieve the progressive realisation of these rights

- .. to establish a national health system which encompasses public, private and non-governmental providers of health services; …

Progress measured against goals of equity, efficiency and access to the healthcare system

Policy Flow in Medical Schemes since 1994

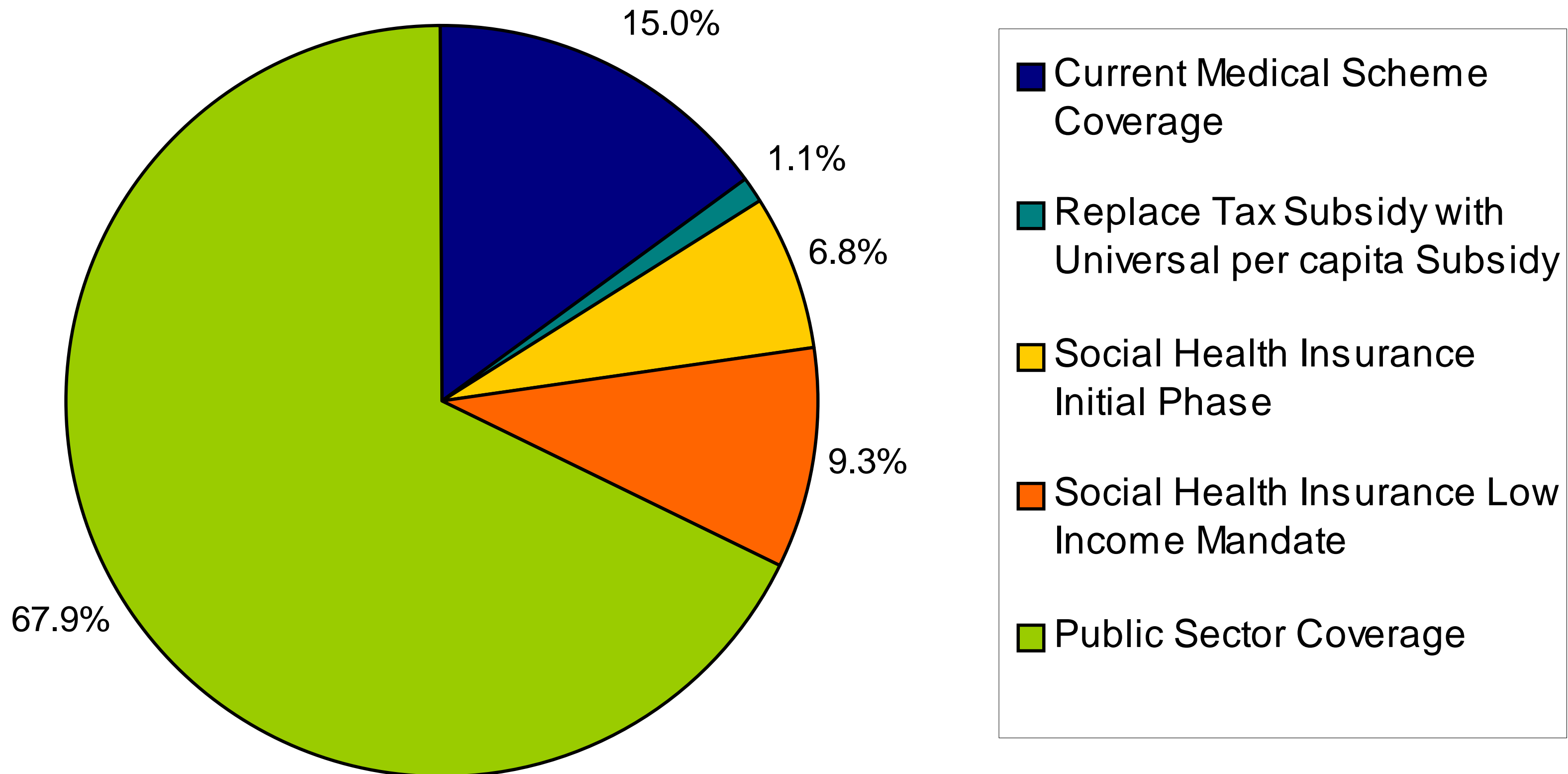
- Open enrolment
- Community rating
- Prescribed Minimum Benefits

Medical Schemes Act 1998 (effective January 2000)

- Replace private sector tax subsidy with per capita subsidy
- Risk-adjusted cross-subsidies to medical schemes
- Income cross-subsidies through social security tax
- Mandatory cover for all employed

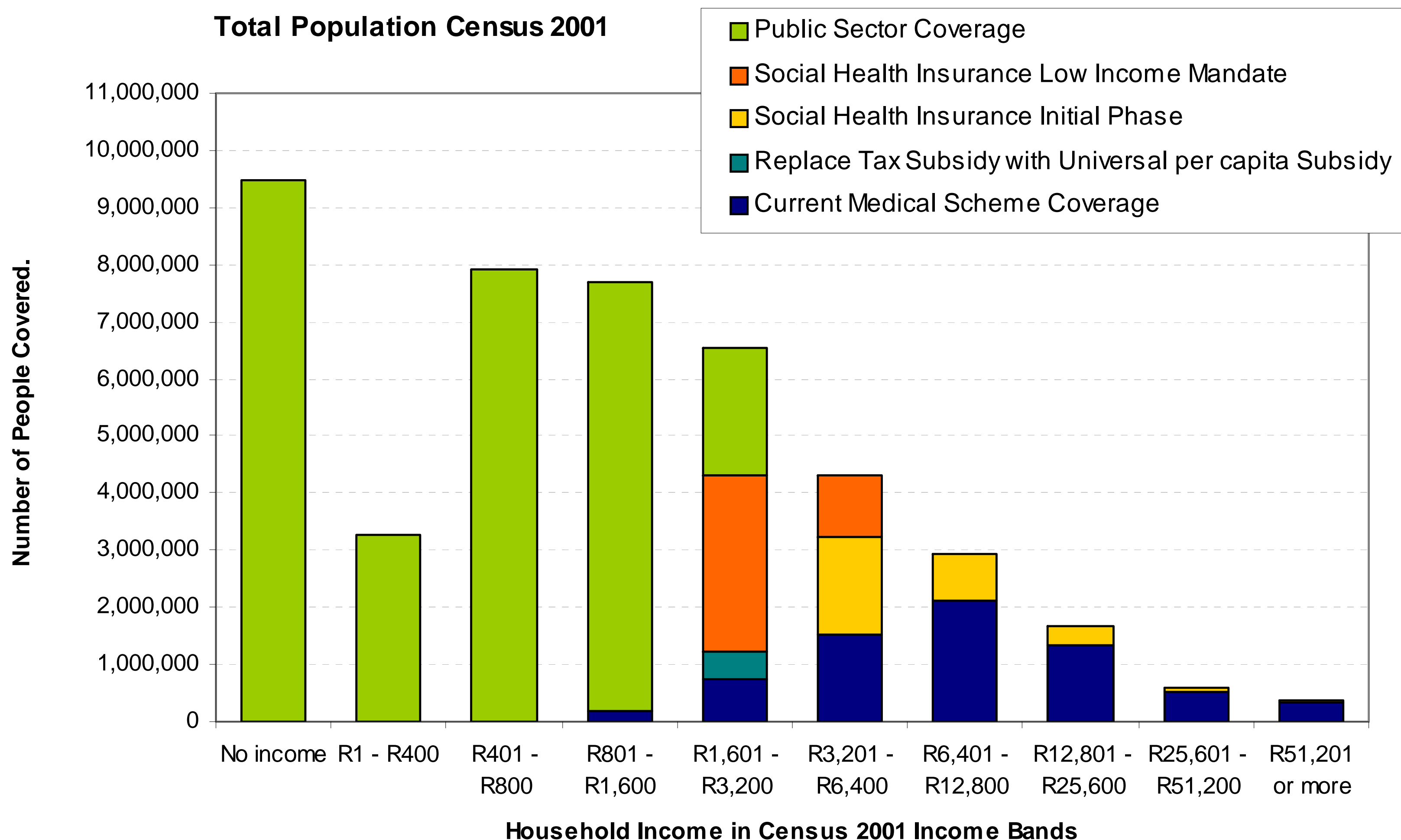
Social Health Insurance

Future Healthcare Financing



Source: SHI Model Based on Census 2001

Coverage by Household Income



Source: SHI Model Based on Census 2001

Structure of South African Health System CURRENT

Revenue collection

Pooling

Purchasing

Provision

General taxation

Provincial Health Departments

Other governmental

Social Insurance (RAF, COIDA)

Private insurance (medical schemes)

Out-of-pocket

No pooling (individual purchasing)

Private providers

Source: Ministerial Task Team on SHI 2005, using Kutzin framework

Structure of South African Health System
Social Health Insurance

Revenue collection

Pooling

Purchasing

Provision

General taxation

Provincial Health Departments

Other governmental

Social Insurance (RAF, COIDA)

Social Insurance (payroll tax)

Risk Equalization Fund

Private insurance (Medical Schemes)

Private providers (including public hospitals)

Out-of-pocket

No pooling (individual purchasing)

Source: Ministerial Task Team on SHI 2005, using Kutzin framework

Structure of South African Health System
National Health Insurance

Revenue collection
National Insurance
Out-of-pocket
Pooling
Purchasing
Provision
Provincial Health Departments
Other governmental
Social Insurance (RAF, COIDA)
Risk Equalization Fund
Private insurance (Medical Schemes)
No pooling (individual purchasing)
Private providers (including public hospitals)

Simple step from SHI to NHI: only a difference in revenue collection. However requires substantial increase in employment to be affordable.

Source: Ministerial Task Team on SHI 2005, using Kutzin framework

Risk-Adjusted Cross-Subsidies

Loss of Efficiency through Cream Skimming

- "The larger the predictable profits arising from cream skimming, the greater the chance that cream skimming will be more profitable than improving efficiency."
- "At least in the short-run, when a health plan has limited resources available to invest in cost-reducing activities, it may prefer to invest in cream skimming rather than in improving efficiency… Efficient health plans, who do not cream skim applicants, may lose market share to inefficient health plans who do, resulting in a welfare loss to society."

  Van de Ven *et al* (March 1999, p.13)
- "Risk-equalisation should improve efficiency and reward those with lower costs."
- "To achieve this risk-equalisation models must be based on objective risk factors or diagnostic information, not actual treatment, utilization or expenses incurred."

Source : DoH Social Security Report 2002

Intention of the Risk Equalisation Fund (REF)

- The primary objective of the Risk Equalisation Fund in South Africa is to protect the environment of open enrolment and community rating.
- The purpose is to prevent competition between medical schemes from occurring on the basis of risk selection.
- In doing so it will encourage competition between medical schemes on the basis of cost and quality of healthcare delivery.

Source : Department of Health, 2002

Social Health Insurance

Universal subsidy

Government

Risk Equalisation Fund

Existing tax expenditure subsidy

Risk- equalised subsidy

Income-based contribution

Member

Employer

Medical Scheme

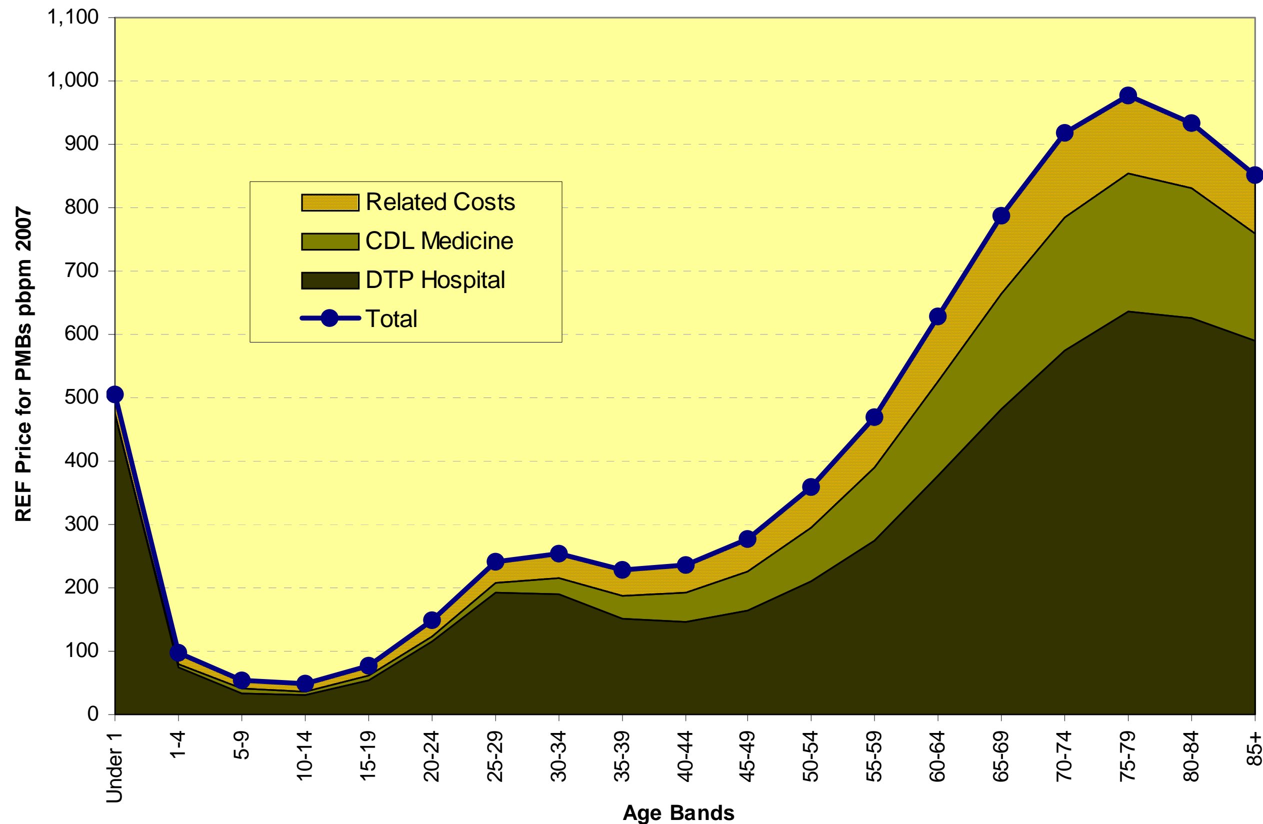
Community-rated Contribution

Risk Definition

- Thus the REF will attempt to equalise the predictable financial consequences that are introduced to the medical schemes environment in view of the requirements of community rating, open enrolment and PMBs.
- In the context of the REF, risk is defined as:
  - the expected and predictable significant deviation from the theoretical national community-rated price for groups of beneficiaries with a measurable set of risk factors
  - the national community-rated price is the reasonably efficient achievable price for the common set of benefits.

Source : FCTT, 14 October 2003

Price by Age and Components for Prescribed Minimum Benefits



DTP Hospital covers some 290 diagnosis-treatment pairs, largely hospital-based. CDL Medicine covers medicine for 25 chronic conditions and HIV/AIDS. Related costs is out-of-hospital care and diagnosis for the above.

Source: REF Contribution Table 2007

Risk Equalisation Fund

Age Profiles
Largest Open Schemes

Registered Total
a
b
c
d

Proportion of Beneficiaries

15.00%
14.00%
13.00%
12.00%
11.00%
10.00%
9.00%
8.00%
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%

Under 1
1-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+

Amount pbpm Payable to REF

Amount pbpm Payable to REF

100
80
60
40
20
0
-20
-40
-60
-80
-100

Amounts to be paid to REF

Amounts received from REF

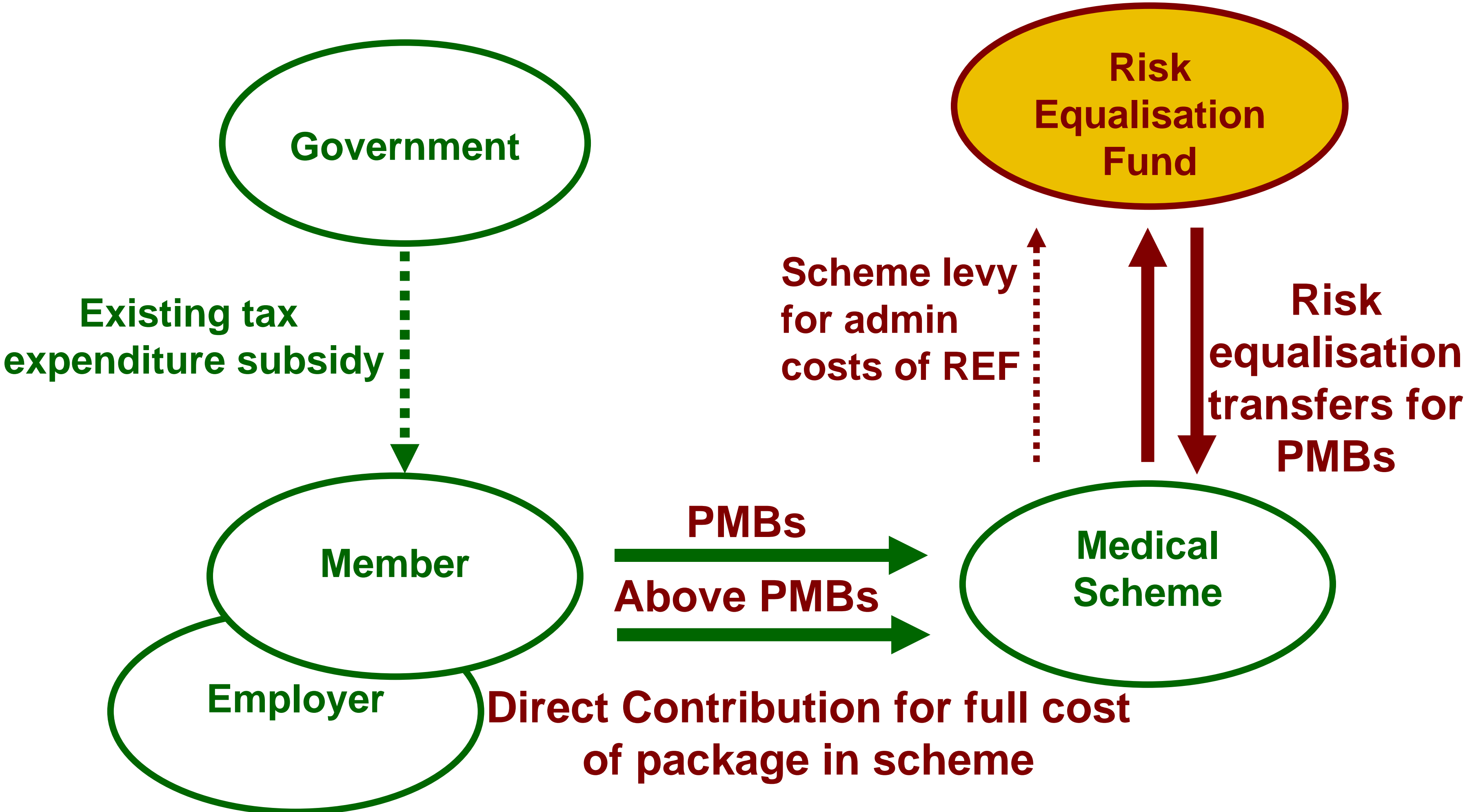
Open Open Open Open Open Open Open Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted Restricted

Truncated at -R100. Maximum received from REF over R600 pbpm.

Scheme Type

Industry Community Rate for March 2006 is R224.90

Isolated REF in Shadow Period



Risk Factors in Formula

- **Age**
- **Deliveries**
- **Gender** (from 2007)
- Not ethnicity. Not geographic region
- Not open/restricted scheme
- Not primary member, marital status or family size
- Not income
- **Measures of chronic disease burden:**
  - **Numbers with each CDL disease**
  - **Numbers with multiple CDL diseases**
  - **Numbers with HIV/AIDS on ARV therapy**
- Not high cost, low frequency conditions.

Source: FCTT 5 November 2003; RETAP 2007

REF Contribution Table

[Base 2005, Use 2007]

REF Contribution Table [Base 2005, Use 2007]

Per Beneficiary Per Month

Expected Industry REF Community Rate 257.05

Th[illegible] actual Industry Community Rate for each payment pe[illegible]od is determined according to the REF Grids that are ap[illegible]roved for shadow payments.

Chronic Disease List (CDL) Conditions

Age Bands	No CDL Diseases **NON**	**ADS**	**AST**	**BCE**	**BMD**	**CHF**	**CMY**	**COP**	**CRF**	**CSD**	**DBI**	**DM1**	**DM2**	**DYS**	**EPL**	**GLC**
Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Under 1	505.04															
1-4	87.62	234.97	391.53	551.32	1,266.05	1,267.57	1,267.57	1,459.04	15,986.75	1,293.86	921.26	1,505.94	535.45	693.80	795.78	311.50
5-9	40.45	187.80	344.35	504.15	1,218.88	1,220.39	1,220.39	1,411.87	15,939.57	1,246.68	874.09	1,458.76	488.27	646.63	748.61	264.33
10-14	37.41	184.76	341.31	501.11	1,215.84	1,217.35	1,217.35	1,408.83	15,936.54	1,243.64	871.05	1,455.71	485.23	643.59	745.57	261.28
15-19	55.41	202.76	359.33	519.11	1,233.84	1,235.36	1,235.36	1,426.83	15,954.53	1,261.65	889.05	1,473.71	503.23	661.59	763.57	279.28
20-24	87.76	235.11	391.66	551.46	1,266.19	1,267.71	1,267.71	1,459.18	15,986.89	1,294.00	921.40	1,506.06	535.57	693.94	795.92	311.63
25-29	123.63	270.98	427.53	587.33	1,302.04	1,303.57	1,303.57	1,495.05	16,022.74	1,329.87	957.27	1,541.93	571.44	729.80	831.78	347.50
30-34	142.63	289.99	446.55	606.34	1,321.06	1,322.59	1,322.59	1,514.05	16,041.76	1,348.87	976.27	1,560.94	590.45	748.81	850.80	366.51
35-39	[illegible]	295.36	[illegible]	611.71	1,326.44	1,327.96	1,327.96	1,519.43	16,047.14	1,354.25	981.65	1,566.31	595.83	754.19	856.17	371.88
40-44	166.14	313.4[illegible]	470.05	[illegible]29.85	1,344.56	1,346.09	1,346.09	1,537.56	16,065.26	1,372.38	999.78	1,584.45	613.96	772.32	874.31	390.02
45-49	[illegible]	340.17	[illegible]	656.52	1,371.25	1,372.77	1,372.77	1,564.24	16,091.95	1,399.06	1,026.46	1,611.14	640.65	799.00	900.98	416.70
50-54	243.13	390.48	547.03	706.82	1,421.55	1,423.07	1,423.07	1,614.54	16,142.24	1,449.36	1,076.77	1,661.42	690.94	849.30	951.28	466.99
55-59	312.98	460.33	616.89	776.69	1,491.40	1,492.93	1,492.93	1,684.40	16,212.10	1,519.22	1,146.62	1,731.29	760.80	919.16	1,021.15	536.86
60-64	421.34	568.69	725.26	885.05	1,599.77	1,601.29	1,601.29	1,792.76	16,320.47	1,627.59	1,254.98	1,839.65	869.17	1,027.52	1,129.51	645.22
65-69	527.24	674.59	831.15	990.94	1,705.66	1,707.19	1,707.19	1,898.66	16,426.36	1,733.48	1,360.88	1,945.54	975.06	1,133.41	1,235.40	751.11
70-74	606.36	753.71	910.26	1,070.06	1,784.79	1,786.30	1,786.30	1,977.77	16,505.49	1,812.59	1,440.00	2,024.66	1,054.18	1,212.54	1,314.52	830.23
75-79	645.30	792.65	949.22	1,109.01	1,823.73	1,825.26	1,825.26	2,016.72	16,544.43	1,851.54	1,478.94	2,063.61	1,093.13	1,251.48	1,353.47	869.18
80-84	596.89	744.24	900.80	1,060.60	1,775.31	1,776.84	1,776.84	1,968.31	16,496.01	1,803.13	1,430.53	2,015.20	1,044.71	1,203.07	1,305.06	820.76
85+	534.18	681.53	838.11	997.89	1,712.61	1,714.14	1,714.14	1,905.60	16,433.31	1,740.43	1,367.82	1,952.49	982.01	1,140.36	1,242.34	758.06

Combined Female and Male Tables for Comparison

											HIV/ AIDS
HAE	**HYL**	**HYP**	**IBD**	**IHD**	**MSS**	**PAR**	**RHA**	**SCZ**	**SLE**	**TDH**	**HIV**
17	18	19	20	21	22	23	24	25	26	27	28
10,815.39	312.80	257.26	514.11	943.30	9,013.45	976.71	453.66	727.06	1,342.03	170.86	1,084.96
10,768.22	265.62	210.09	466.94	896.12	8,966.27	929.54	406.48	679.89	1,294.85	123.69	1,037.77
10,765.18	262.58	207.05	463.90	893.08	8,963.23	926.50	403.44	676.85	1,291.81	120.64	1,034.74
10,783.17	280.59	225.05	481.90	911.08	8,981.23	944.49	421.45	694.85	1,309.82	138.65	1,052.75
10,815.53	312.93	257.41	514.26	943.42	9,013.58	976.85	453.79	727.20	1,342.17	171.00	1,085.09
10,851.40	348.80	293.28	550.13	979.29	9,049.45	1,012.72	489.65	763.07	1,378.04	206.87	1,120.96
10,870.40	367.82	312.28	569.13	998.30	9,068.46	1,031.72	508.68	782.08	1,397.04	225.88	1,139.97
10,875.77	373.19	317.65	574.50	1,003.69	9,073.83	1,037.10	514.05	787.45	1,402.42	231.25	1,145.35
10,893.91	391.31	335.79	592.64	1,021.81	9,091.96	1,055.23	532.17	805.59	1,420.55	249.39	1,163.47
10,920.59	418.00	362.46	619.31	1,048.50	9,118.65	1,081.91	558.86	832.26	1,447.23	276.06	1,190.16
10,970.89	468.30	412.77	669.62	1,098.78	9,168.94	1,132.21	609.16	882.57	1,497.53	326.36	1,240.46
11,040.75	538.15	482.63	739.48	1,168.65	9,238.80	1,202.07	679.01	952.43	1,567.39	396.23	1,310.31
11,149.11	646.51	590.99	847.84	1,277.02	9,347.16	1,310.43	787.38	1,060.79	1,675.76	504.59	1,418.68
11,255.01	752.41	696.89	953.74	1,382.90	9,453.06	1,416.33	893.28	1,166.69	1,781.65	610.48	1,524.58
11,334.12	831.53	776.00	1,032.85	1,462.03	9,532.17	1,495.45	972.39	1,245.80	1,860.76	689.60	1,603.69
11,373.07	870.48	814.95	1,071.80	1,500.97	9,571.13	1,534.39	1,011.35	1,284.75	1,899.71	728.55	1,642.65
11,324.66	822.06	766.54	1,023.39	1,452.56	9,522.71	1,485.98	962.92	1,236.34	1,851.30	680.14	1,594.22
11,261.95	759.36	703.83	960.68	1,389.86	9,460.01	1,423.27	900.22	1,173.62	1,788.60	617.43	1,531.53

Modifiers

Modifier for number of chronic conditions

Number of Conditions	2	3	4 or more
	CC2	**CC3**	**CC4**
All Ages	194.88	532.95	1,074.78

Amount is per b[illegible]ficiary per month.
Add to amounts obtained [illegible] 28.
Not applicable to Under 1's.

Modifier for Ma[illegible]

	MAT
All Ages	17,515.39

Amount is pe[illegible]ned).
Use only once per delivery, not monthly.

RETAP

REF Grids in Shadow Period

- The **REF Grid Count** gives the cell to which each beneficiary in the option is allocated. The total number of beneficiaries sums to the number in the option. This table is used to obtain the amount payable by the REF to the scheme.
- The **REF Grid Prevalence** gives the prevalence of each condition. For example a beneficiary with asthma and hypertension is counted in both columns. The total therefore exceeds the number of beneficiaries in the option by the extent of multiple CDL conditions. This table is used for research purposes and to enable comparison of prevalences to published medical literature.

Haemophilia Rate per 1,000

All Schemes : All Administrators	Haemophilia

Per 1,000 Beneficiaries

Month	Actual
Jan	0.456
Feb	0.461
Mar	0.486
Apr	0.413
May	0.414
Jun	0.395
Jul	0.089
Aug	0.082
Sep	0.081
Oct	0.018
Nov	0.019
Dec	0.018

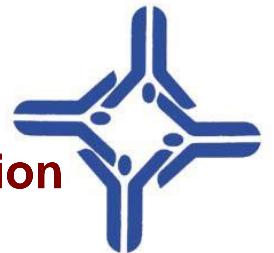
Actual / Expected

Problems resolved

Over-reporting of HAE by 9 schemes resolved.

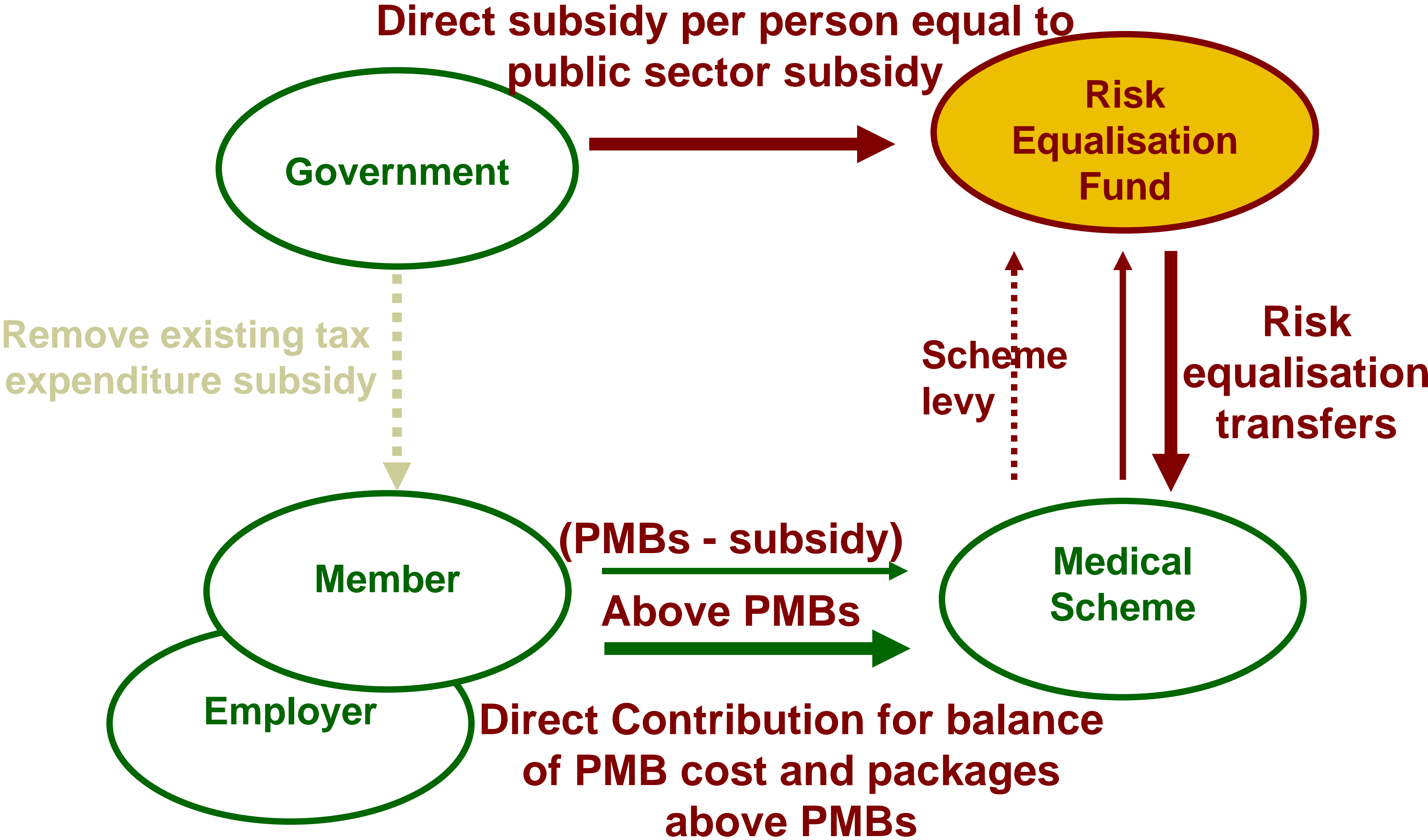
Problems with one scheme remain.

Risk Equalisation Fund



Income Cross-Subsidies

Universal Per Capita Subsidy



Problems with Current Pillar 1 Subsidy for Healthcare

Current Tax Expenditure Subsidy: Medical Expenditure
Current Tax Expenditure Subsidy: Employer Subsidy
Current Notional Public Sector Benefit

Married, Spouse not earning, 2 children

Monthly Amount.

900
800
700
600
500
400
300
200
100
0

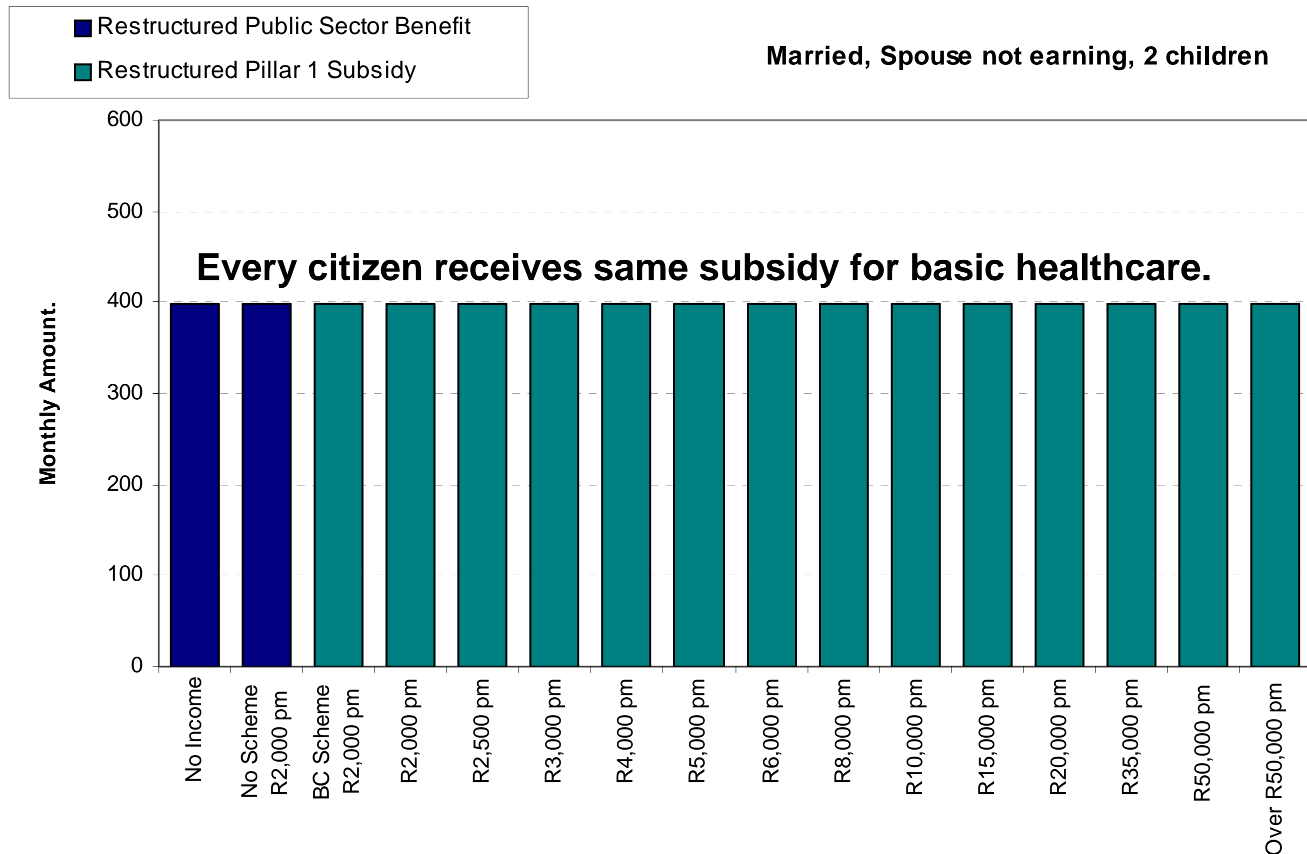
No Income
No Scheme R2,000 pm
BC Scheme R2,000 pm
R2,000 pm
R2,500 pm
R3,000 pm
R4,000 pm
R5,000 pm
R6,000 pm
R8,000 pm
R10,000 pm
R15,000 pm
R20,000 pm
R35,000 pm
R50,000 pm
Over R50,000 pm

Lower income groups receive least subsidy

Income too high for fully-subsidised public sector health care. But income too low for tax expenditure subsidy.

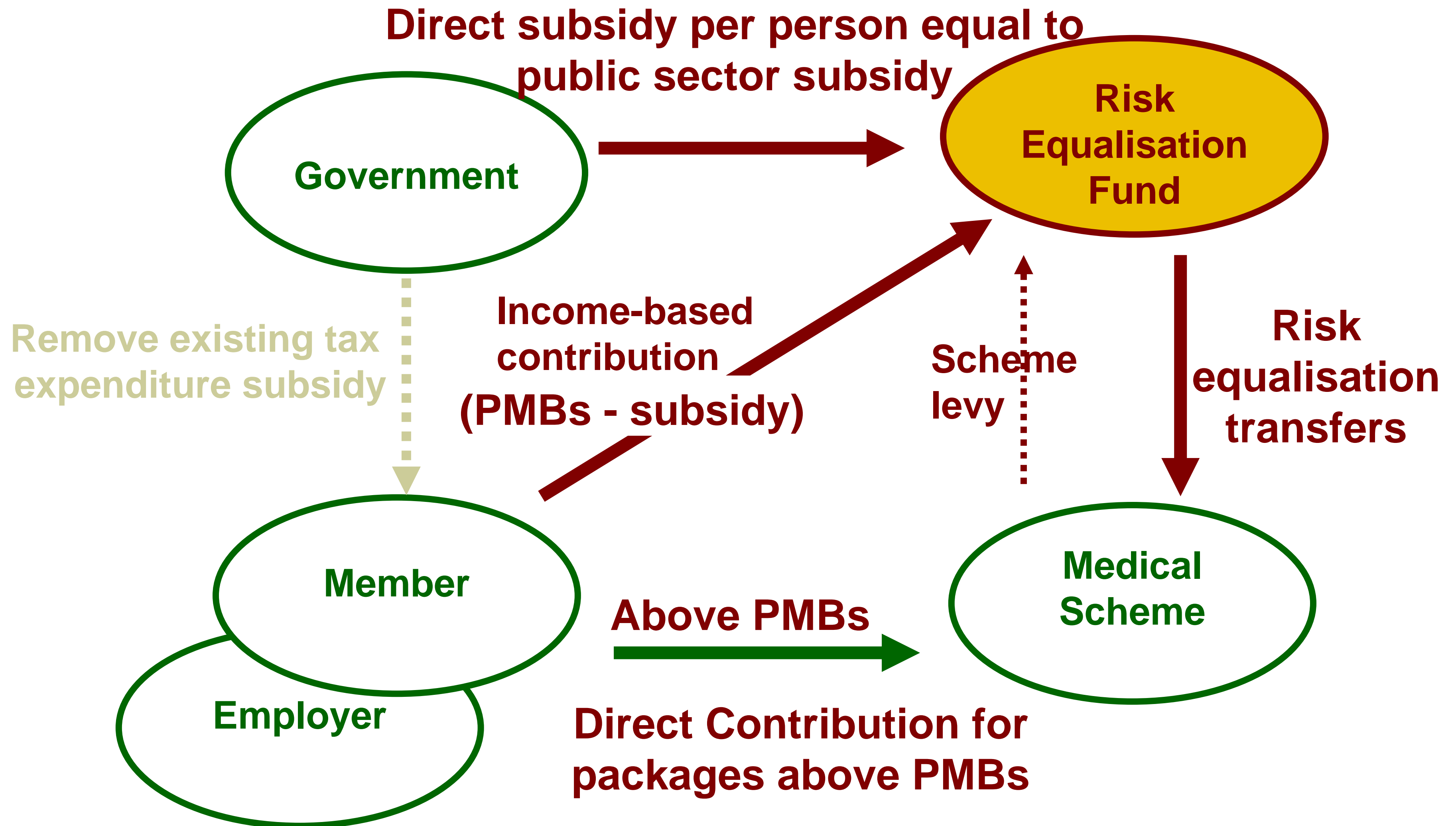
Higher income groups receive most subsidy

DoH Proposal: Restructured Pillar 1 Subsidy for Healthcare



In the private sector the subsidy is used for the Prescribed Minimum Benefit package, redefined to include primary care (the Basic Benefit Package or BBP).

Social Health Insurance



Phased Implementation of SHI

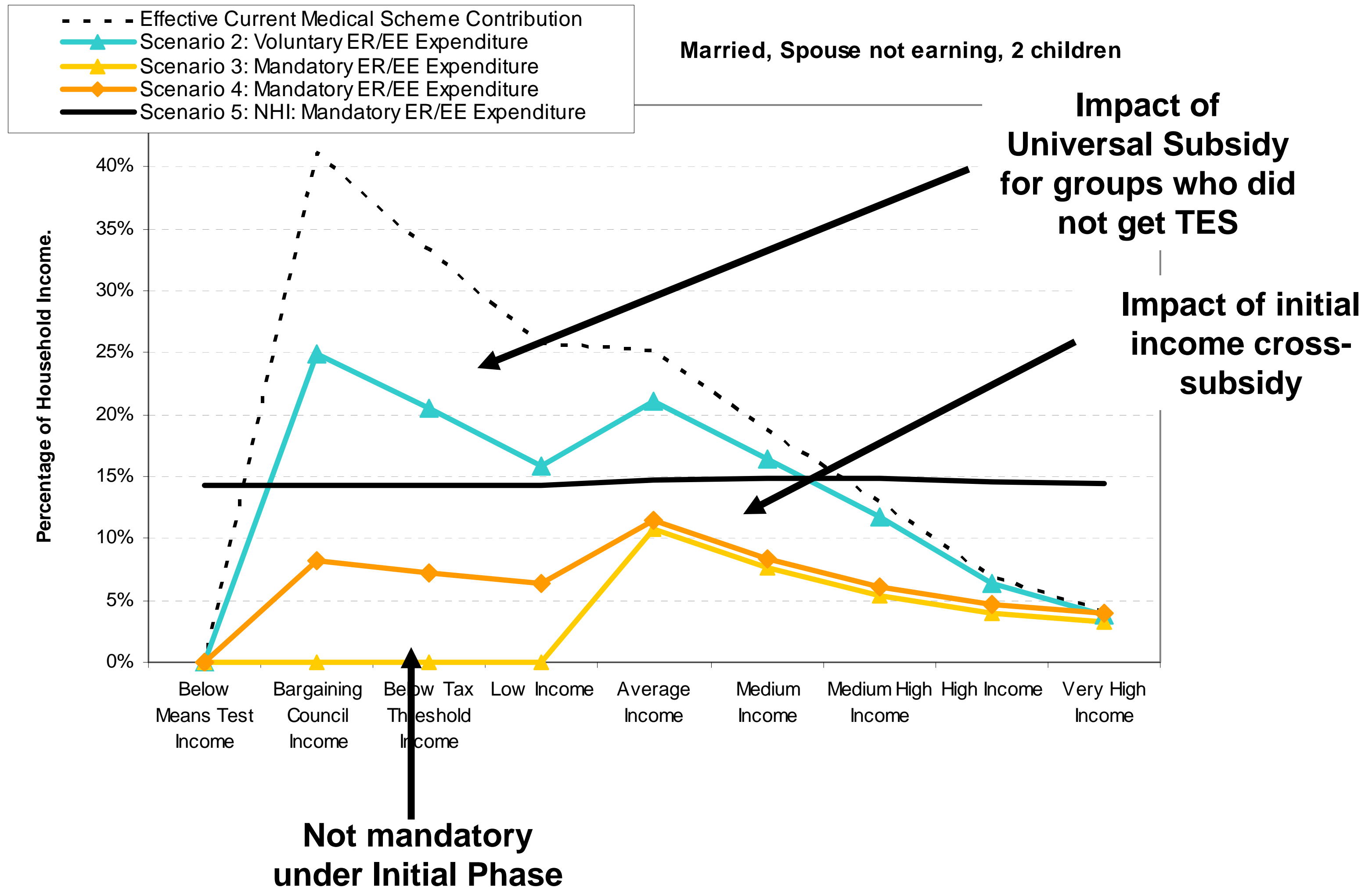
- **Current Situation**
  - 6.9 million people. Health tax equivalent: 1.2%
- **Scenario 2: Restructure Pillar 1 Subsidy**
  - Up to 8.3 million people. Health tax equivalent: 1.5%
- **Scenario 3: Social Health Insurance Phase 1**
  - 10.5 million people. Health tax equivalent: 3.1%
- **Scenario 4: Social Health Insurance Phase 2**
  - 13.4 million people. Health tax equivalent: 4.1%
- **Scenario 5: National Health Insurance**
  - Total population. Health tax equivalent: 14.3%
  - NHI is not affordable

Source: Ministerial Task Team on SHI July 2005

Mandatory Contributions

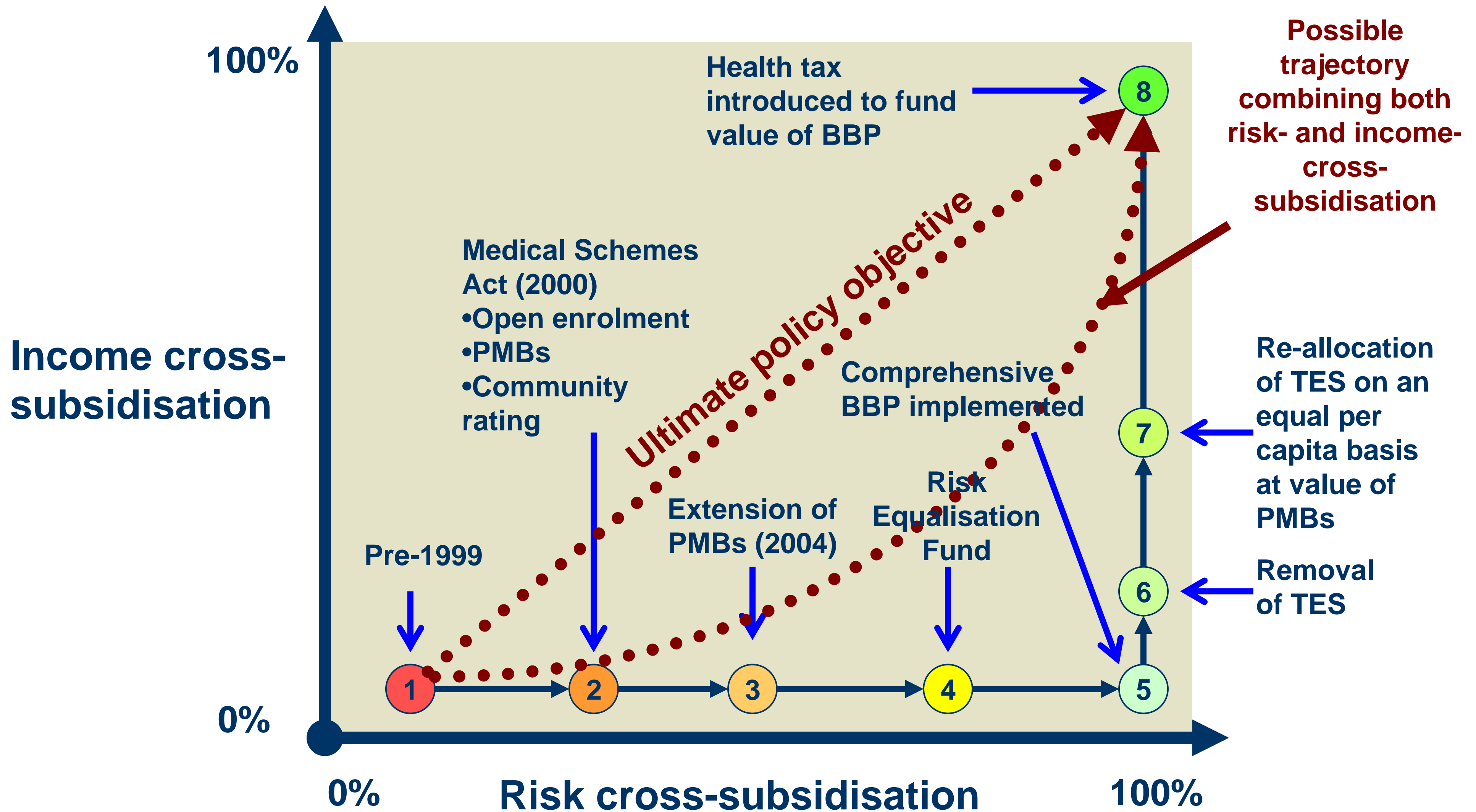
- International Review Panel: split the idea of "mandatory membership" from that of "mandatory contributions".
- SHI flow of funds envisages **mandatory contributions**.
- Need to use SARS (tax authorities) to determine income and to collect contributions to SHI.
- **Mandatory membership** could follow some years later but may not be essential.

Summary of Mandatory Impact as a Percentage of Family Income



Source: Analysis for Ministerial Task Team on SHI

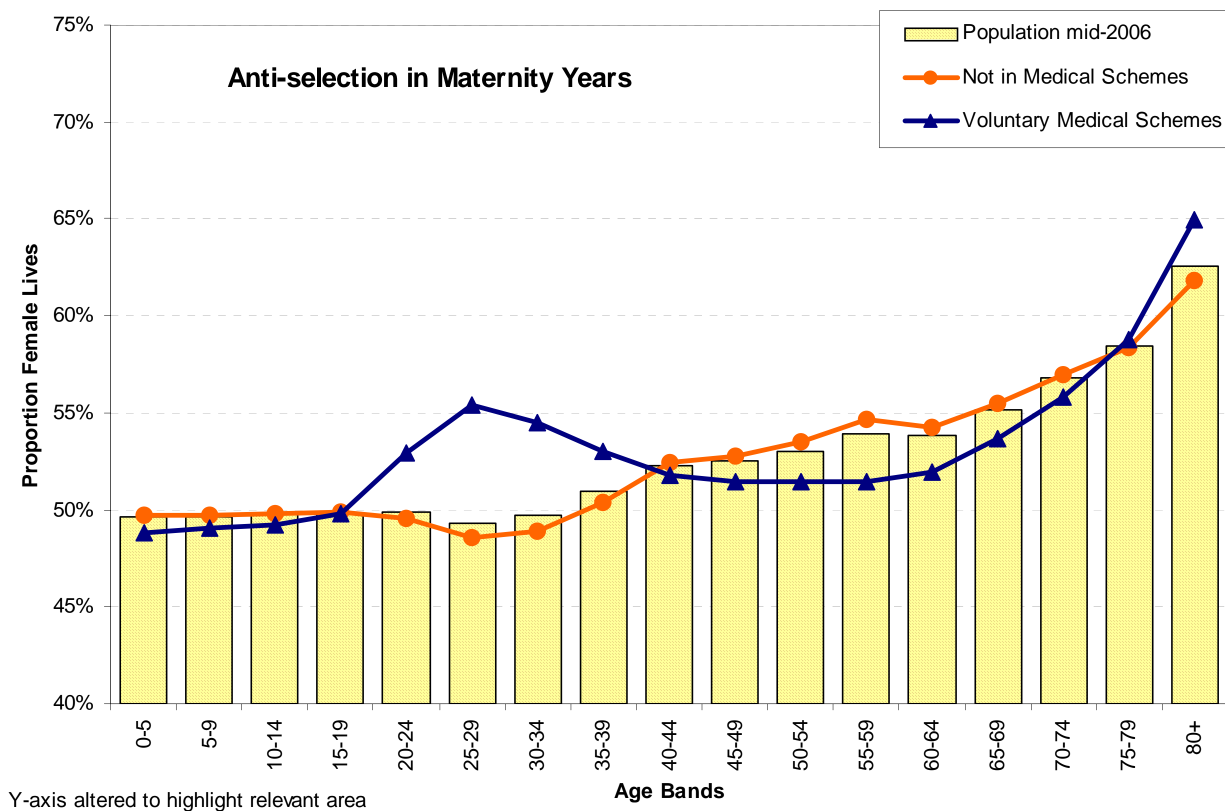
Policy Objective and Trajectory



Source: MTT July 2005

Voluntary to Mandatory Cover

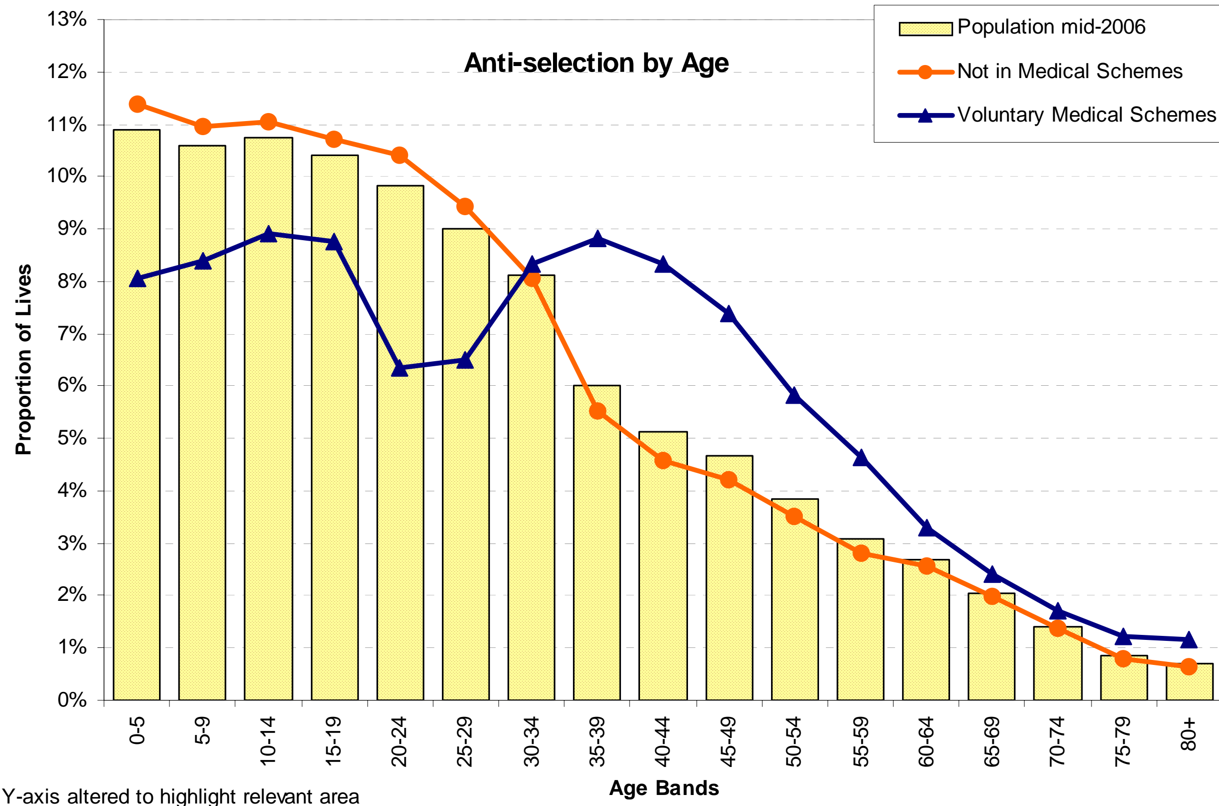
Anti-Selection in Maternity Years



Significant female anti-selection in child-bearing years.

Source: StatsSA and REF, mid-year 2006

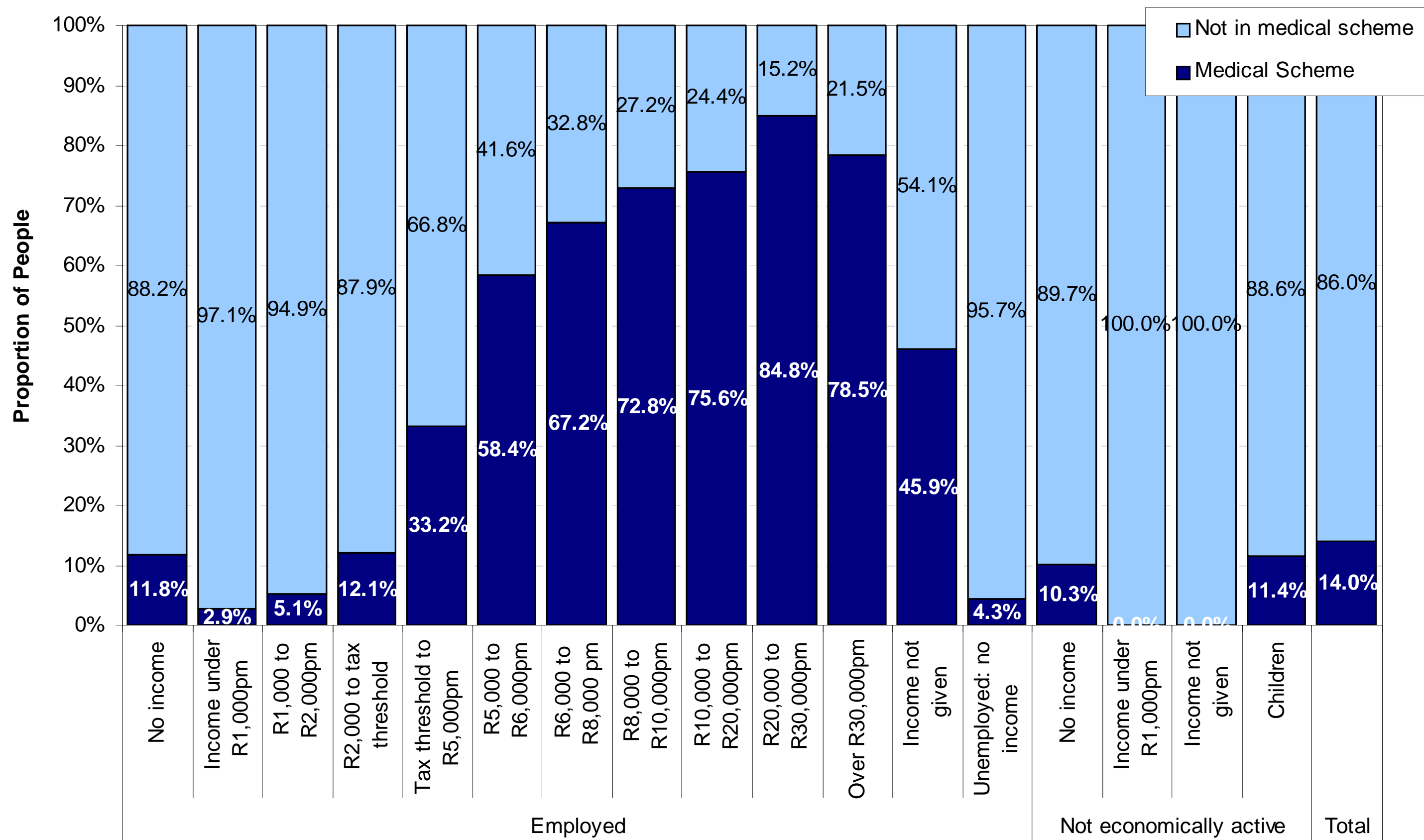
Anti-selection by Age



Far fewer children and young adults, many more late working age and older lives if full NHI. For SHI, need to consider effect using income bands.

Source: StatsSA and REF, mid-year 2006

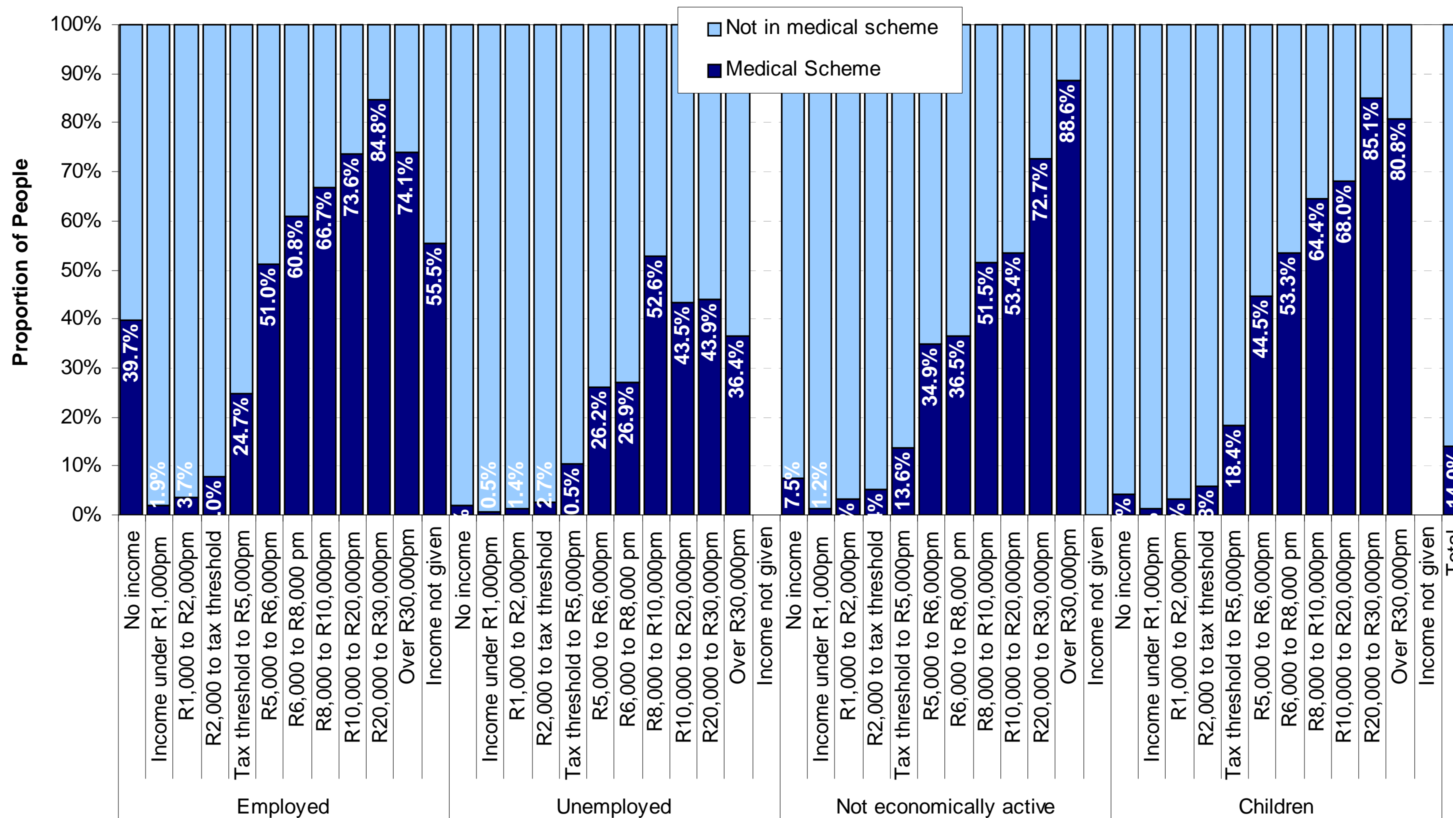
Medical Scheme Membership by Individual Income



Clear and strong pattern of membership by income.

Source: EPRI GHS2005

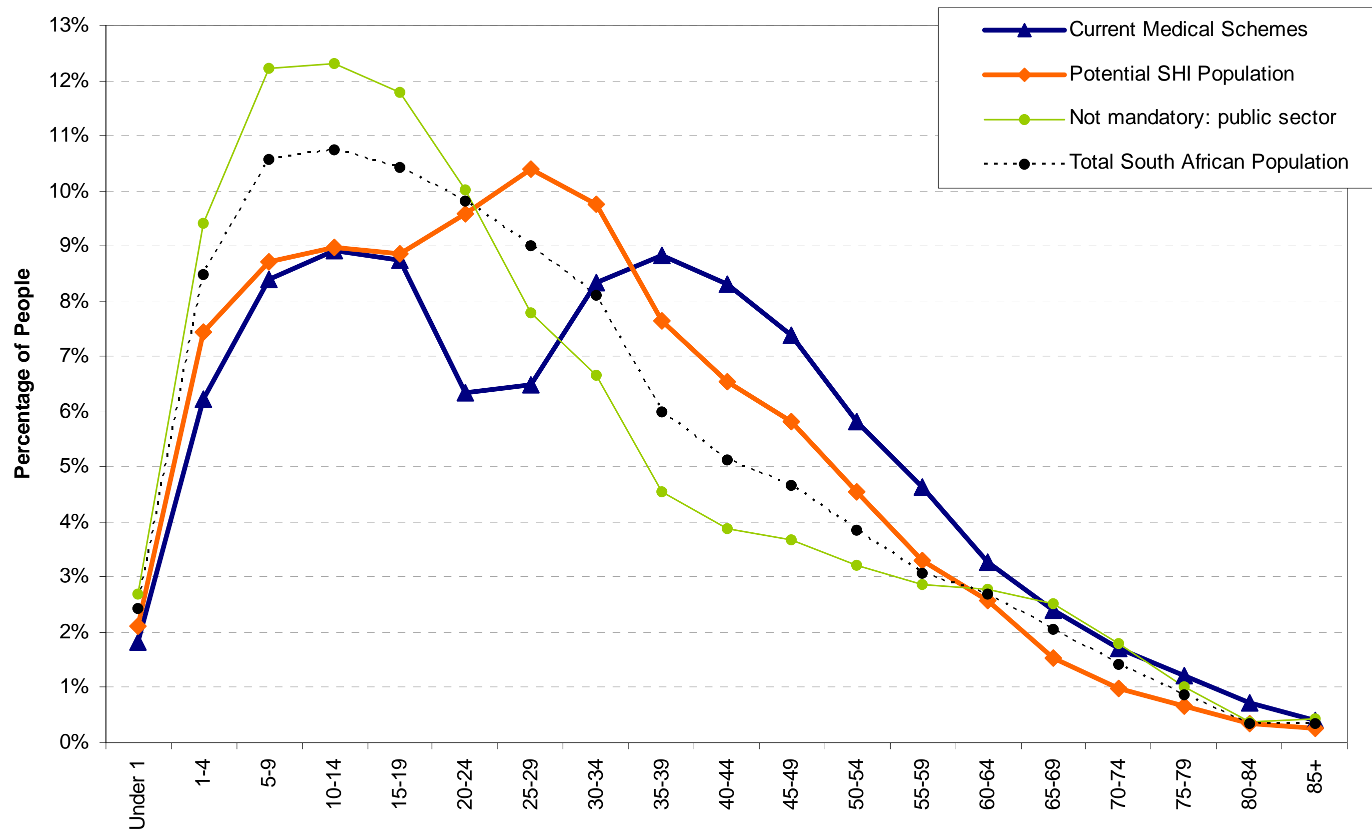
Medical Scheme Membership by Highest Household Income



Clear and strong pattern of membership by Household income.

Source: EPRI GHS2005

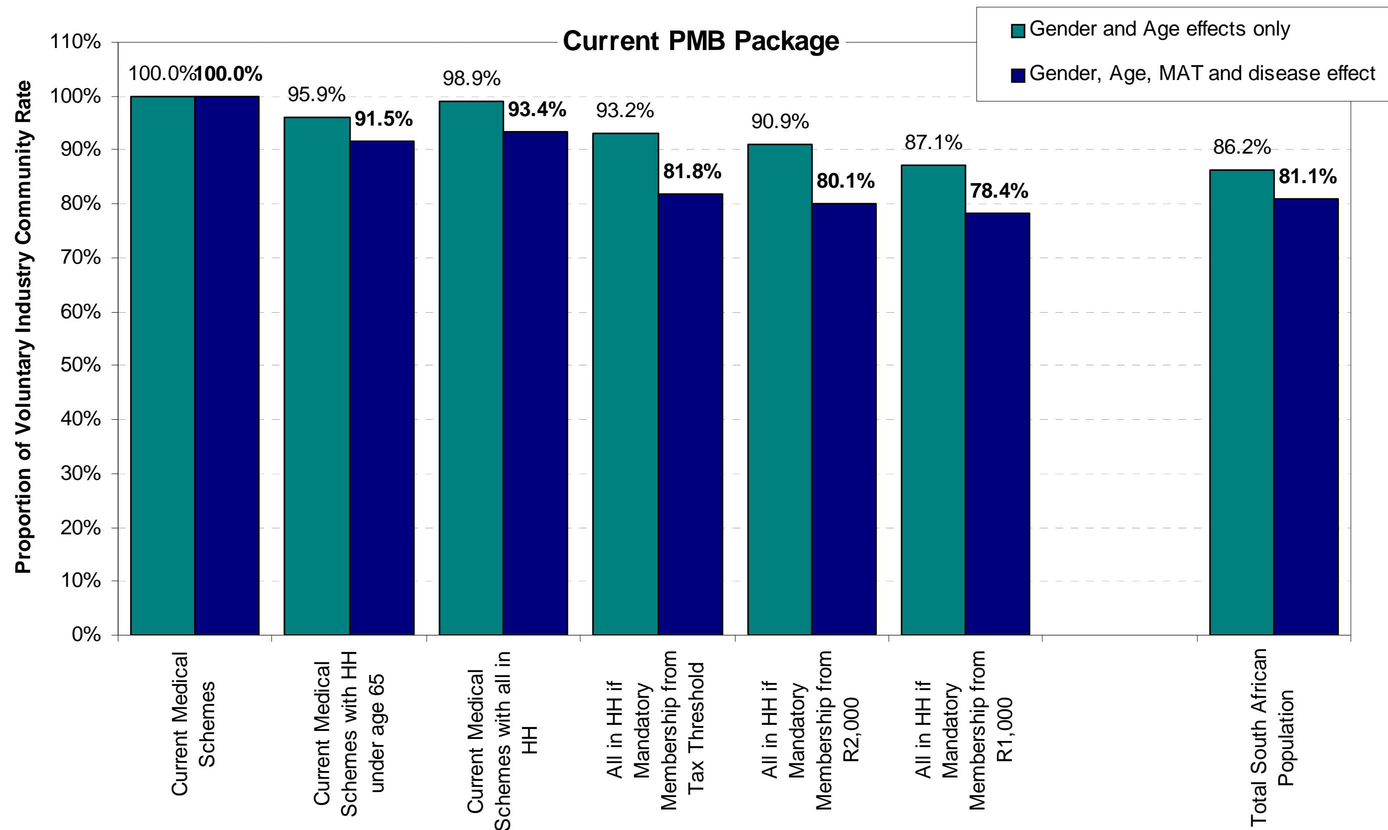
Age Profile Potential SHI



Under SHI, many young adults would be included. Whole tail would become younger.

Source: StatsSA and REF, mid-year 2006; EPRI GHS2005 income patterns

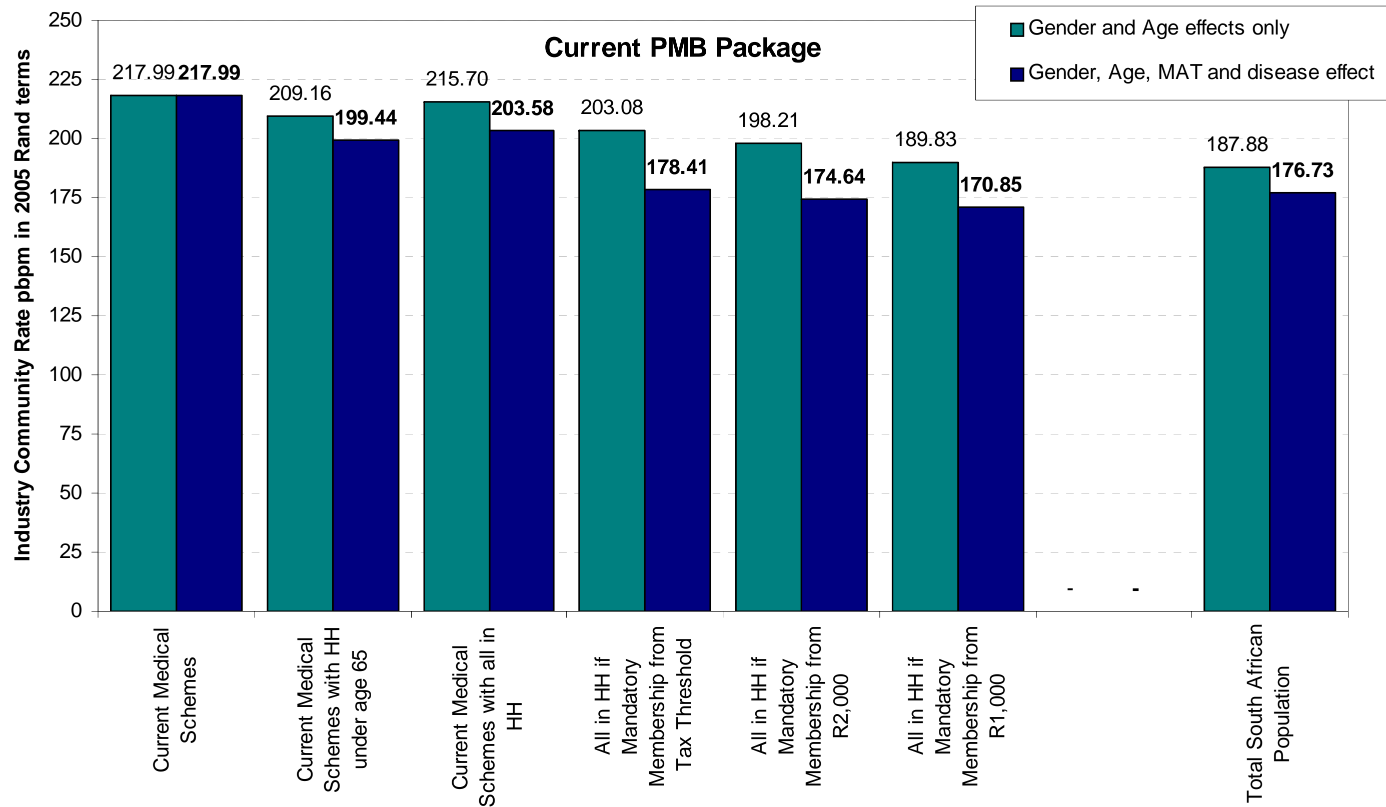
Impact on Community Rate of Mandatory Membership



Price of PMBs falls by some 10% on age and gender effects alone.
Price falls by some 20% if effects of anti-selection included.

Source: StatsSA and REF, mid-year 2006; EPRI GHS2005 income patterns

Impact on Community Rate of Mandatory Membership

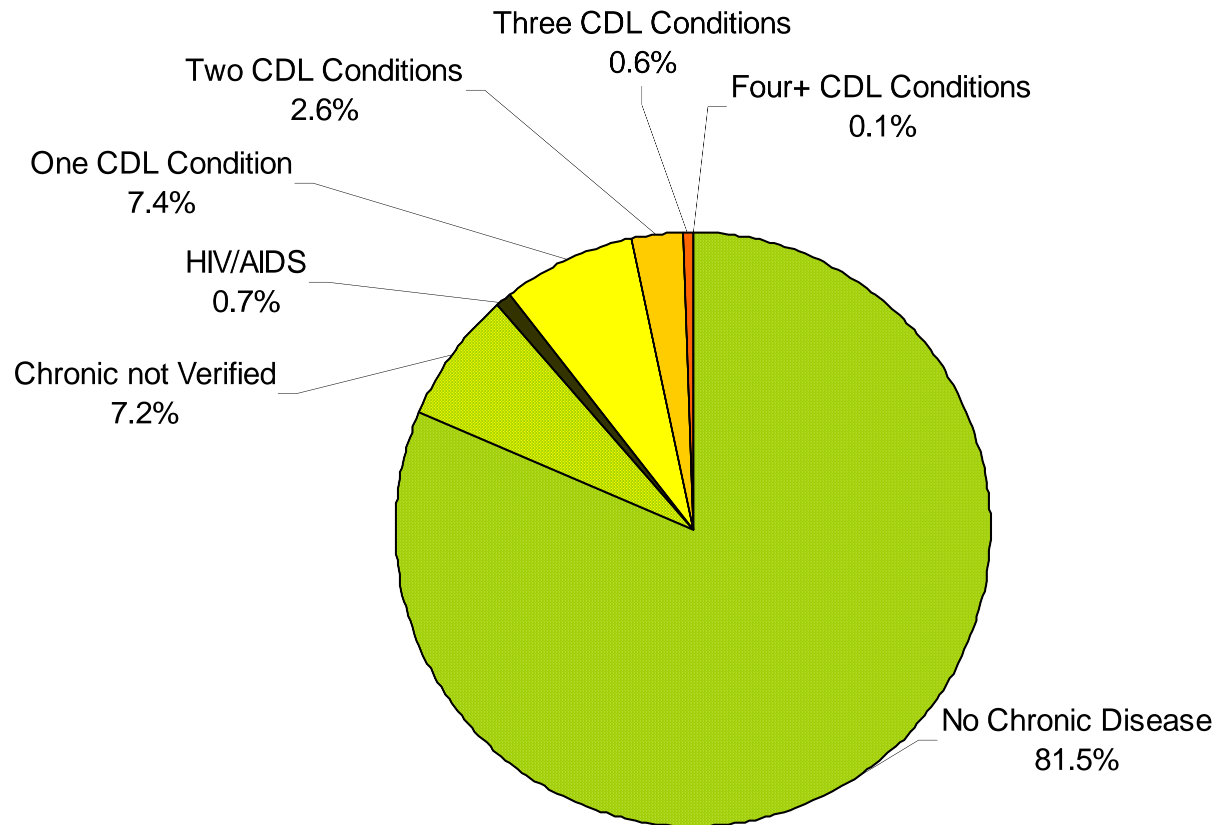


Effects shown in Rand terms.

Source: StatsSA and REF, mid-year 2006; EPRI GHS2005 income patterns

Impact of Chronic Disease on the Price of Healthcare

Prevalence of Chronic Disease



Source: REF Contribution Table 2007

Prevalence by Age of Chronic Disease

650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0

Number of Beneficiaries

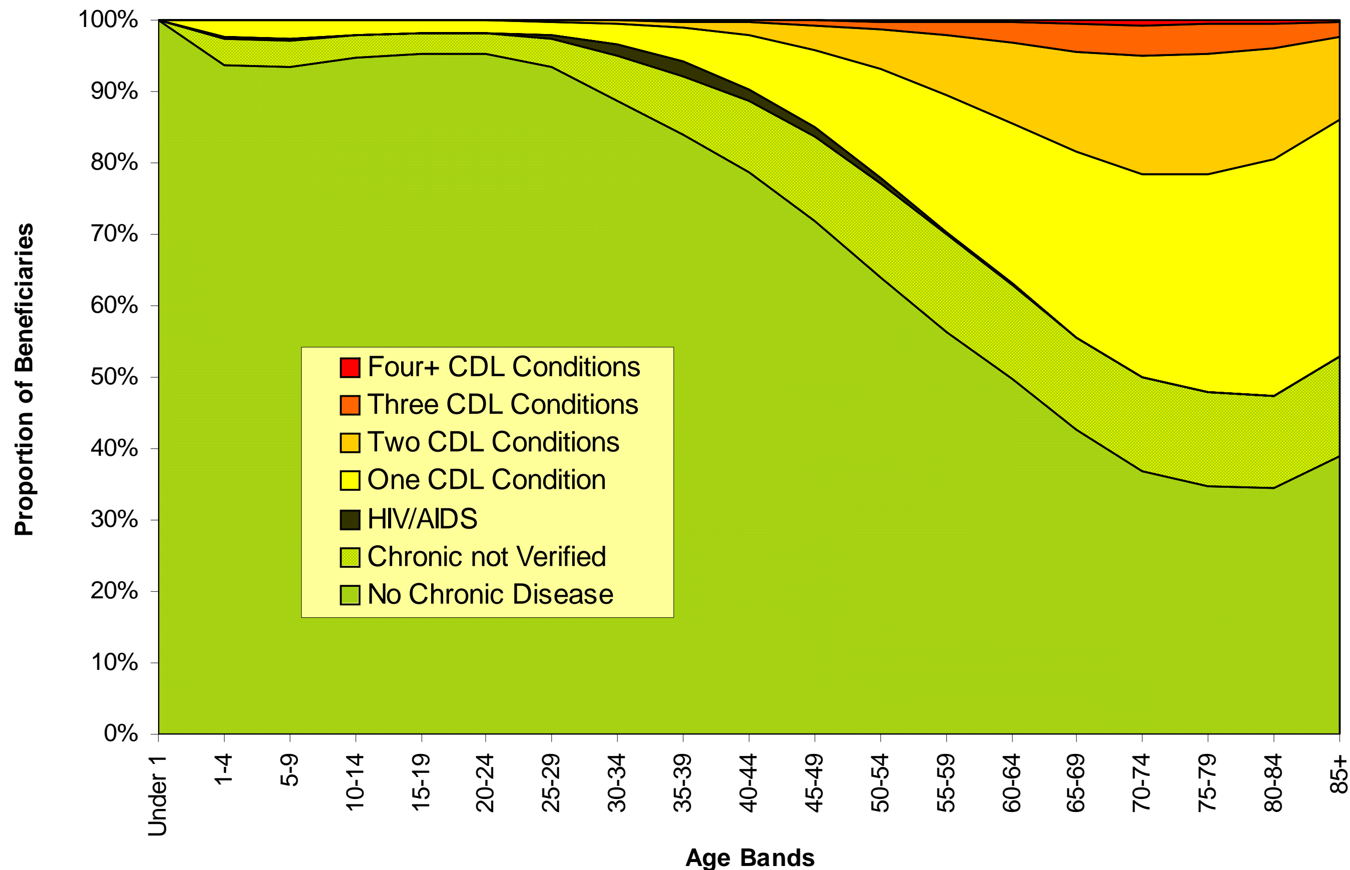
Under 1
1-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+

Age Bands

Four+ CDL Conditions
Three CDL Conditions
Two CDL Conditions
One CDL Condition
HIV/AIDS
Chronic not Verified
No Chronic Disease

Source: REF Contribution Table 2007

Proportion of Chronic Disease by Age



Source: REF Contribution Table 2007

Price by Age of Chronic Disease

CDL Conditions: CDL Medicine
CDL Conditions: Related Costs
CDL Conditions: DTP Hospital
HIV/AIDS
Chronic not Verified
Maternity
No Chronic Disease
Total

REF Price for PMBs pbpm 2007

0
100
200
300
400
500
600
700
800
900
1,000
1,100

Under 1
1-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+

Age Bands

Source: REF Contribution Table 2007

Proportion of Price by Age

Proportion of REF Price for PMBs pbpm 2007

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

CDL Conditions: CDL Medicine

HIV/AIDS

CDL Conditions: Related Costs

Maternity

CDL Conditions: DTP Hospital

Chronic not Verified

No Chronic Disease

Under 1
1-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+

Age Bands

Source: REF Contribution Table 2007

Price by Age of Chronic Disease

Multiple Conditions
Other CDL Conditions
Other Cardiac Conditions
Hypertension, Hyperlipidaemia
Diabetes
Respiratory
HIV/AIDS
Chronic not Verified
Maternity
No Chronic Disease
Total

REF Price for PMBs pbpm 2007

1,100
1,000
900
800
700
600
500
400
300
200
100
0

Under 1, 1-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+

Age Bands

The burden of heart disease is clear.

Source: REF Contribution Table 2007

Chronic Disease in Price of PMBs

REF Price for PMBs pbpm 2007 (axis 0.00–275.00)

Component	Bar 1	Bar 2	Bar 3
Multiple Conditions			9.05
Other CDL Conditions			14.91
Other Cardiac Conditions			17.37
Hypertension, Hyperlipidaemia			28.15
Diabetes			12.23
Respiratory			11.99
CDL Conditions: CDL Medicine		34.22	
CDL Conditions: Related Costs		14.95	
CDL Conditions: DTP Hospital		44.50	
All CDL Conditions	93.70		
HIV/AIDS	7.82	7.82	7.82
Maternity	19.98	19.98	19.98
Chronic not Verified	16.58	16.58	16.58
No Chronic Disease	118.96	118.96	118.96

Community-rated PMB Price R257.05 pbpm

Source: REF Contribution Table 2007

Price by Age of Chronic Disease Using HIV/AIDS Prevalence in 2010

All CDL Conditions
HIV/AIDS 2010
Maternity
No CDL Conditions 2010
Total 2006

REF Price for PMBs pbpm 2006.

1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0

Under 1
1-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+

Age Bands

Source: REF Contribution Table 2006

Components of PMB Price by Age

REF Price for PMBs pbpm 2007

700
600
500
400
300
200
100
0

DTP Hospital
CDL Medicine
Related Costs

Under 1 | 1-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85+

Age Bands

Source: REF Contribution Table 2007

Components of PMB Price

Proportion of REF Price for PMBs 2006.

100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%

NON ADS AST BCE BMD CHF CMY COP CRF CSD DBI DM1 DM2 DYS EPL GLC HAE HYL HYP IBD IHD MSS PAR RHA SCZ SLE TDH HIV CC2 CC3 CC4 MAT Total

REF Contribution Table Column

Related Costs
CDL Medicine
DTP Hospital

R41.45
R45.55
R170.05

Source: REF Contribution Table 2007

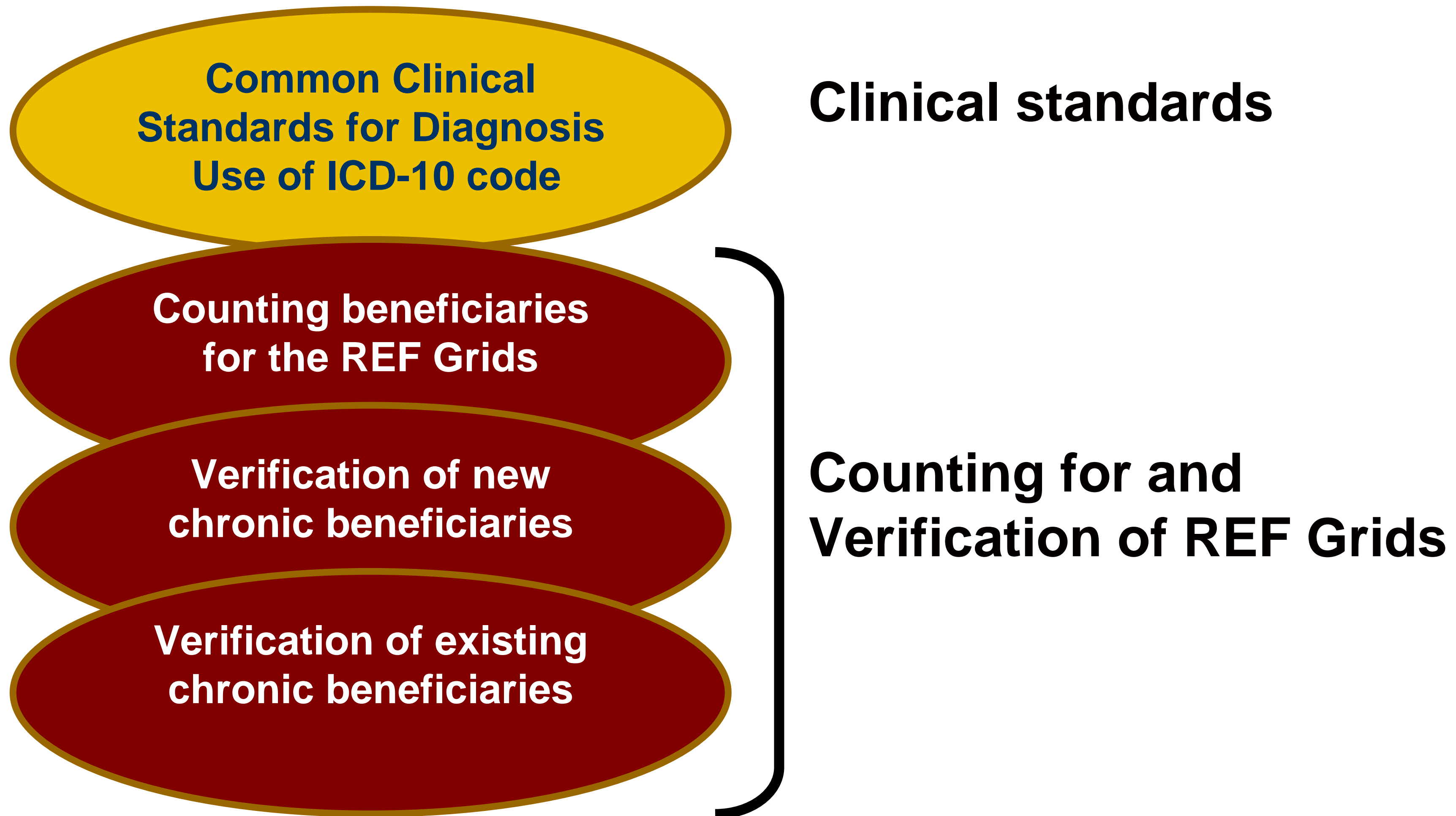
Risk Equalisation using Chronic Disease

Concept of "Treated Patient"

- Because the REF is fundamentally based on financial risk rather than medical risk, the entry criteria/definition should be aimed at the **"treated patient"** rather than the early or "pre-clinical stages" of a medical condition; and

- That the definitions/entry criteria would primarily be used for new patients while currently treated chronic medical scheme patients will not be subjected to these criteria – e.g. it would be medically irresponsible to stop a well-controlled HIV/AIDS, hypertensive or cardiac failure patient's treatment to prove that he/she meets the REF definition/entry criteria.

Role of Entry and Verification Criteria for REF



Definition of TREATED and CASES

- Two sets of data were extracted:
  - The first used the full Entry and Verification definitions and was called the "Treated Patient Data set" or "**TREATED**"
  - The second set was extracted without the test for "treated patient" and was called the "Total Cases Data set" or "**CASES**".
- While this meant a doubling of the extractions, it provided a powerful tool to investigate potential prevalence and cost if compliance improves and to be able to determine the impact if more people in future fall within the definition of "treated patient".
- Most important comparison for REF financial sensitivity is **CASES Count** vs. **TREATED Count.** Difference represents "bubbling under" for each disease.

Source: REF Study 2005

Risk Equalisation Fund

Version 2. 11 May 2006. Applicable from 1 January 2007

Table 17: Hypertension

Hypertension						
For count purposes, only one of the following cardiovascular diseases can be assigned to the same patient: *Cardiomyopathy and Cardiac Failure, Coronary Artery Disease, Dysrhythmias; and Hypertension* For count purposes , only one of *Hypertension or Chronic Renal Disease* may be assigned to the same patient						
Diagnosis-related information					***Proof of Treatment***	
Provider code of the diagnosing provider	AND	ICD10 Codes (Any of the following)		AND	Evidence of payment of claims for any product included in the ATC categories below, in two different calendar months in the three calendar months preceding the current month:	
Any registered medical practitioner		I10 I11 I11.0 I11.9 I12 I12.0 I12.9 I13 I13.0 I13.1 I13.2 I13.9 I15	I15.0 I15.1 I15.2 I15.8 I15.9 O10 O10.0 O10.1 O10.2 O10.3 O10.4 O10.9 O11		C02 C03 C07	C08 C09 G04CA03

	Hypertension
C02	ANTIHYPERTENSIVES
C03	DIURETICS
C07	BETA BLOCKING AGENTS
C08	CALCIUM CHANNEL BLOCKERS
C09	AGENTS ACTING ON THE RENIN-ANGIOTENSIN SYSTEM
G04CA03	Terazosin

CASES and TREATED

TREATED requires Proof of Treatment

Amended April 2007 to use "treatment month" not "payment month" as the latter is being gamed.

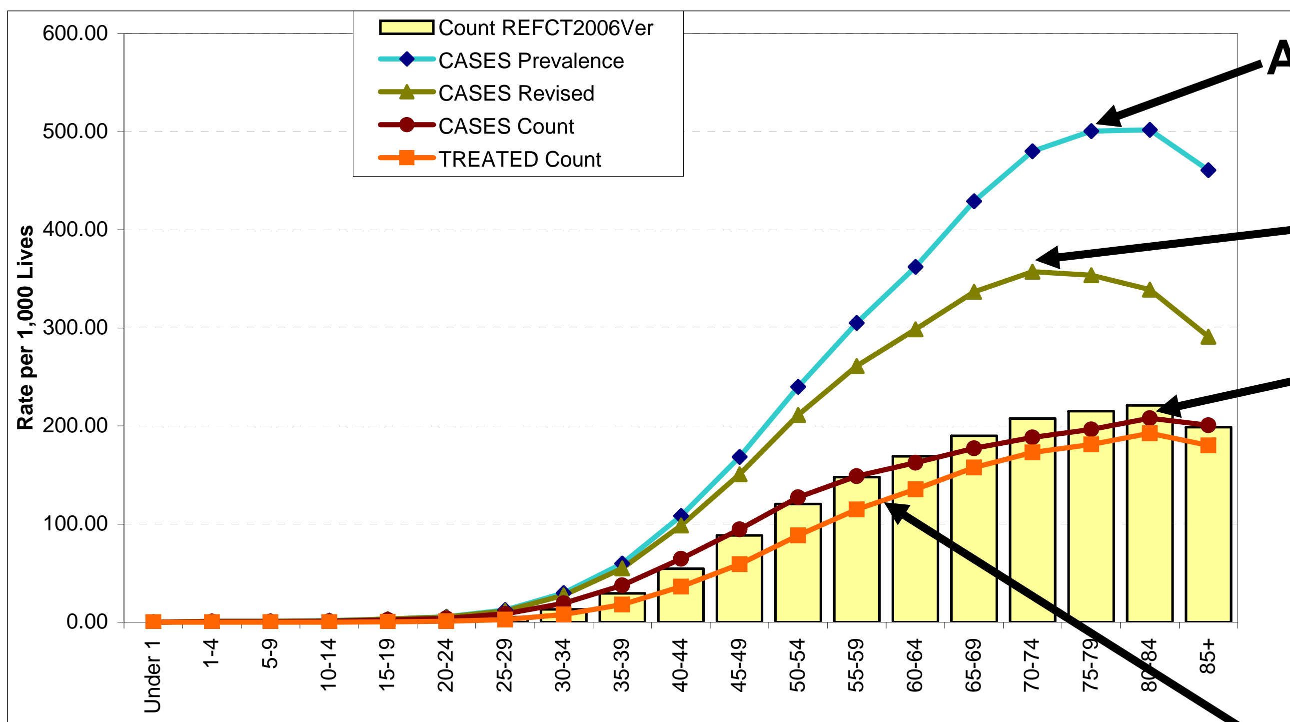
It is possible to spread payment for a multi-line script over two months and hence more people are identified as "treated patients".

Ranking of Diseases in Multiple Disease Rules

- Effectively uses an approach similar to hierarchical co-existing conditions methodology.
- Order of diseases from REFCT2007 using gender as a risk factor.
- Only one disease in the following groups may be selected. Highest cost disease in **bold**:
  - respiratory: **COP**+AST+BCE
  - cardiac: **CMY**+CHF+IHD+DYS+HYP
  - renal: **CRF**+HYP
  - gastro: **CSD**+IBD
  - diabetes: DM1+**DM2** (always default to DM2)
  - mental: **BMD**+SCZ
  - neuro: **MSS**+BMD+EPL
  - skeletal: **SLE**+RHA (other way around in REF Study 2002)

Source: REF Study 2005

Hypertension (HYP)



All with HYP diagnosis

After cardiac and renal multiple rules

Allocation to highest cost disease. Potential HYP count if compliance improves.

REF Grid Count and REF payments: “treated patient”

Impact of renal and cardiac rules at older ages.

cardiac: CMY+CHF+IHD+DYS+HYP

renal: CRF+HYP

Source: REF Study 2005

Risk Equalisation Fund

Price by Age of Chronic Disease

All CDL Conditions
HIV/AIDS
Chronic not Verified
Maternity
No Chronic Disease
Total

REF Price for PMBs pbpm 2007

0
100
200
300
400
500
600
700
800
900
1,000
1,100

Under 1
1-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+

Age Bands

Industry Community Rate for PMBs is R257.05 pbpm

Source: REF Contribution Table 2007

Impact if all Chronic become Verified

CDL previously Verified
Chronic CDL that become Verified
Revised HIV/AIDS
Maternity
No Chronic Disease
Revised Total
Previous Total

REF Price for PMBs pbpm 2007

0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1,000, 1,100, 1,200, 1,300

Under 1, 1-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+

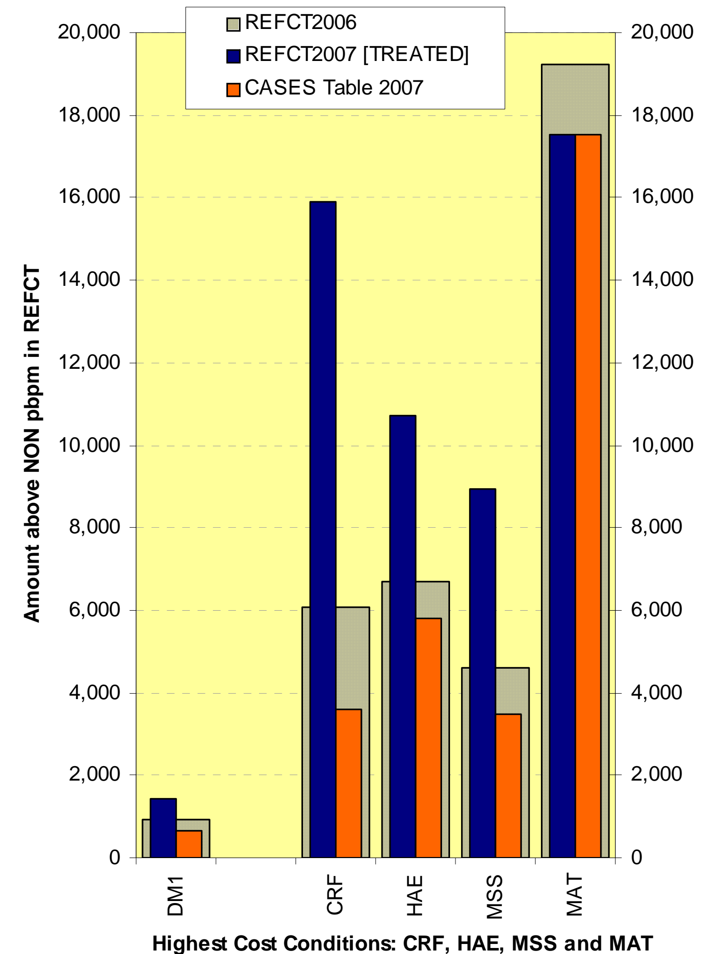
Age Bands

Industry Community Rate increases from R257.05 to R332.75 pbpm

Source: REF Contribution Table 2007

Sensitivity of the REF Table

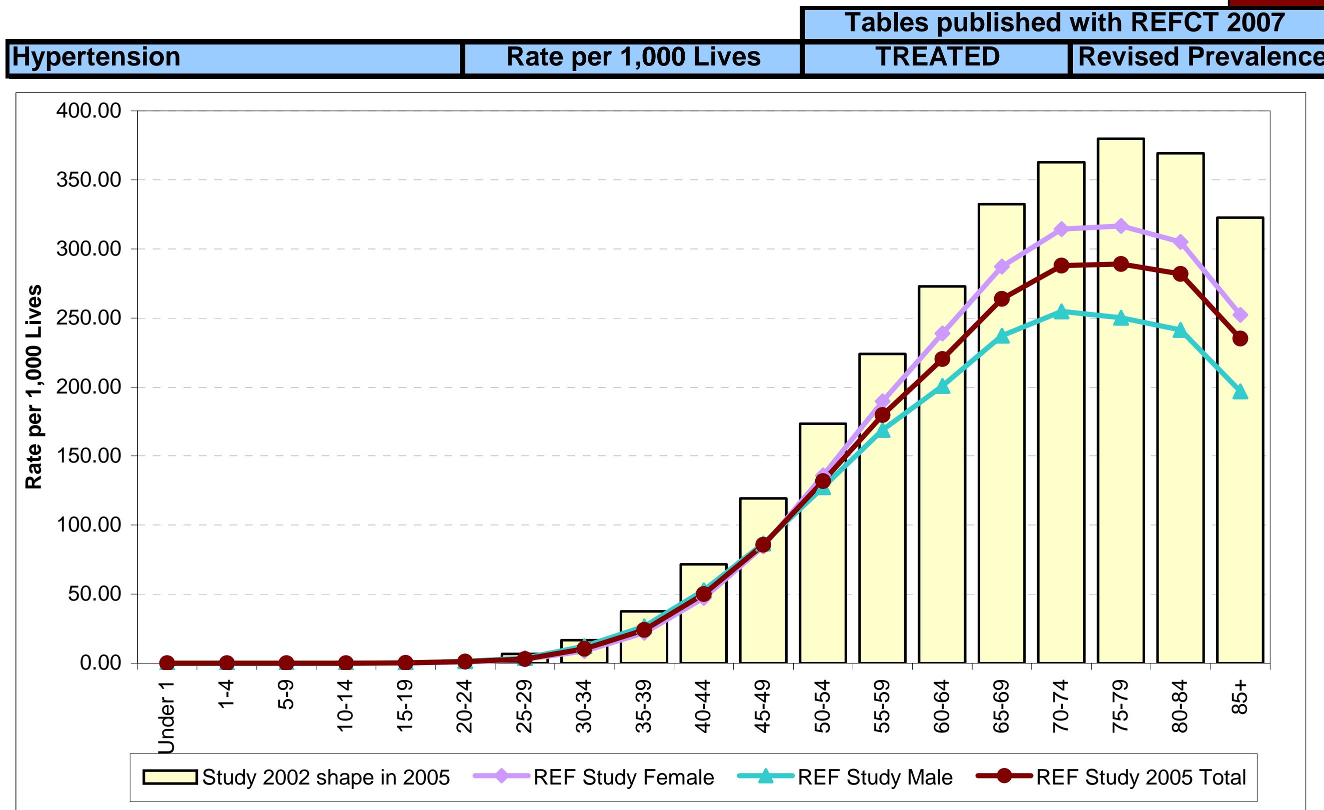
- The Community Rate would be highly unlikely to reach the higher levels. As more chronic people become “treated patients”, so the values for each disease should be altered to be closer to the CASES results.
- The average cost comes down as people are added with less serious disease.
- This is a timing issue – the adjustment to the REF Table takes place annually while there could be an increase in the number of “treated patients” during the year.
- Schemes only need to consider changes in industry numbers of “treated patients” during a year, until the next revision of the REF Table.



Prevalence of Chronic Disease

Hypertension Prevalence

TREATED
Verified

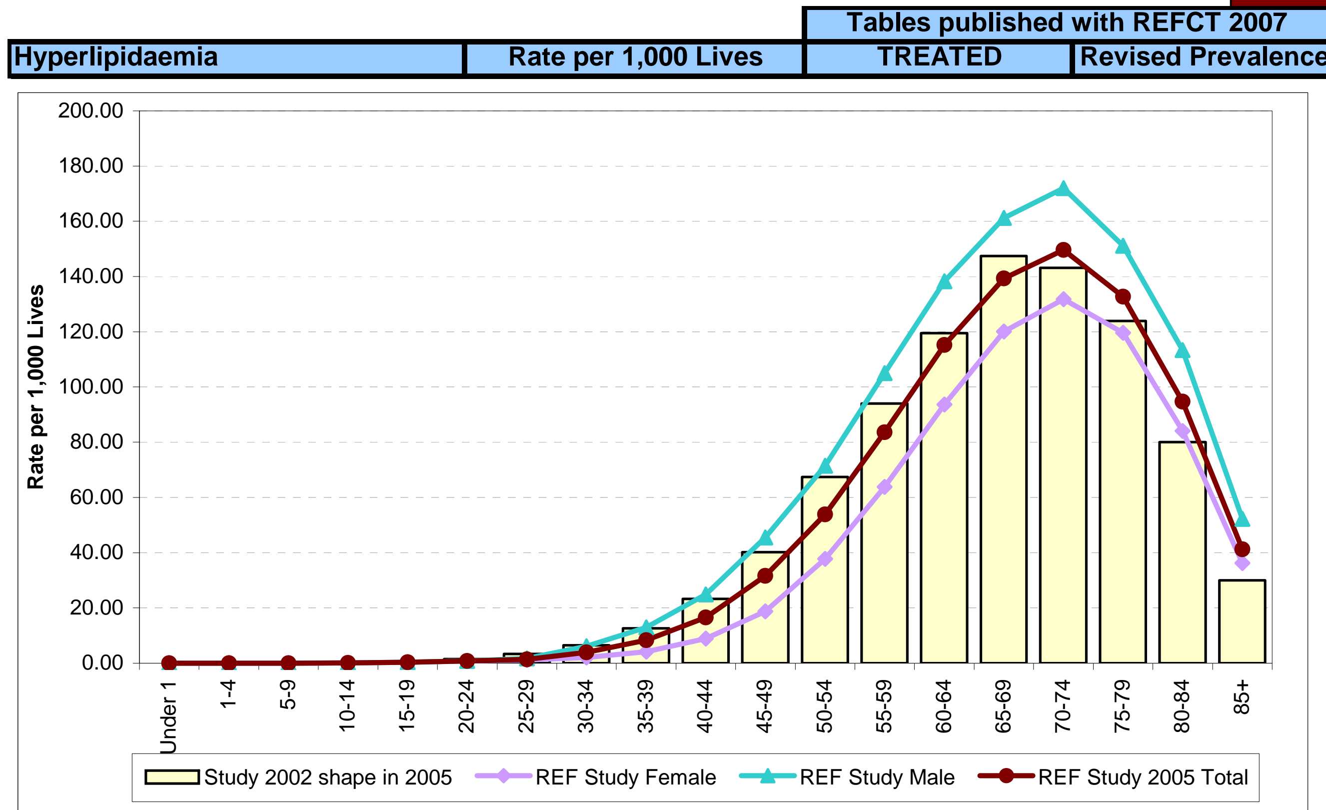


Impact of renal and cardiac multiple rules at older ages.

Source: REF Study 2005

Hyperlipidaemia Prevalence

TREATED Verified

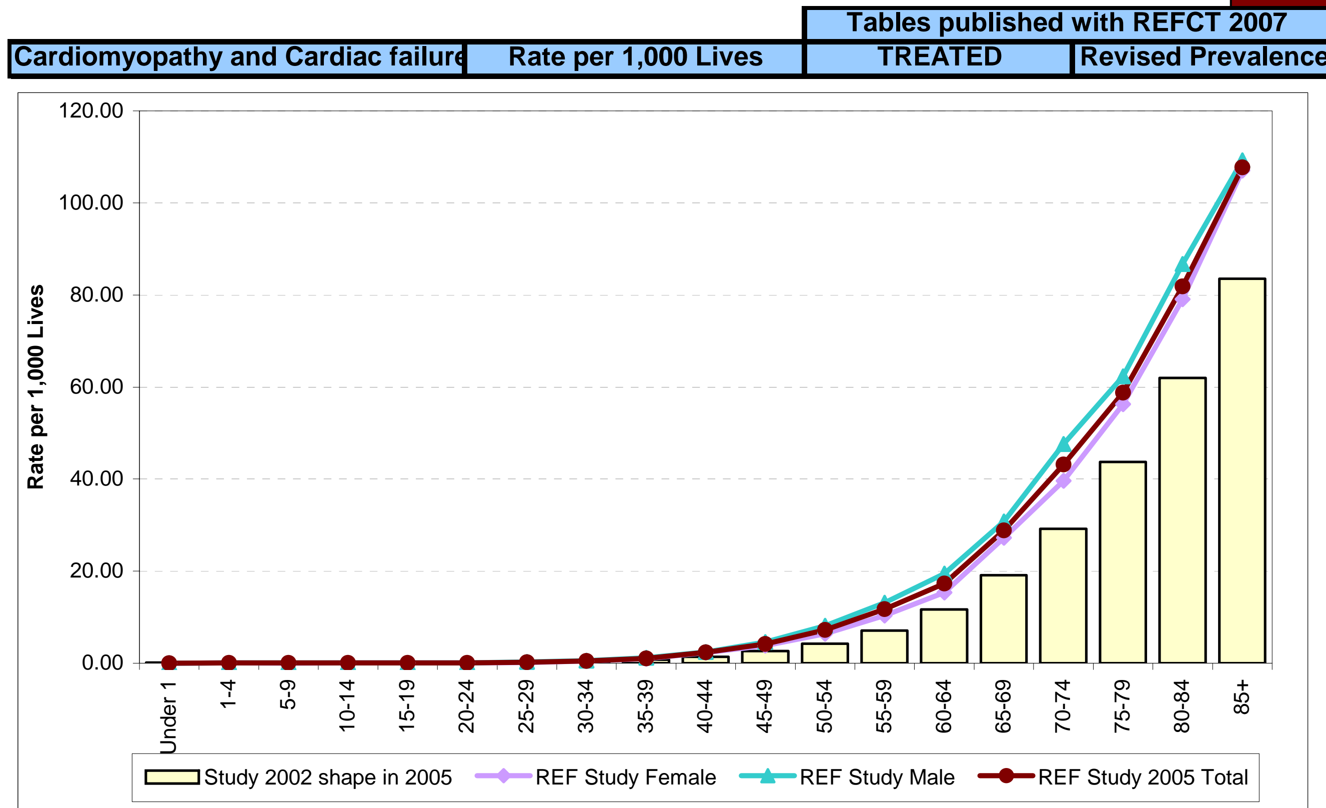


Not included in cardiac multiple rule. Levels similar to 2002. Predominantly male.

Source: REF Study 2005

Cardiomyopathy and Cardiac Failure Prevalence

TREATED
Verified



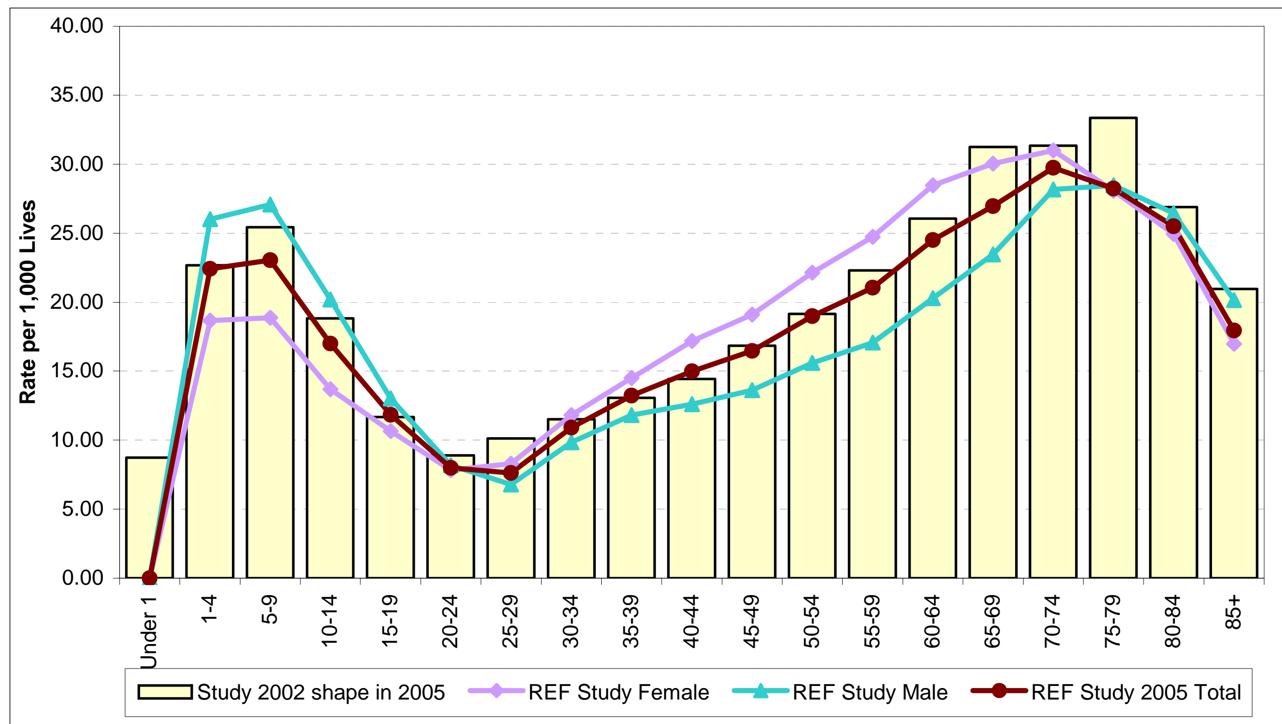
Diseases now combined but prevalence exceeds CHF+CMY in 2002.

Source: REF Study 2005

Asthma Prevalence

TREATED Verified

Asthma	Rate per 1,000 Lives	TREATED	Revised Prevalence

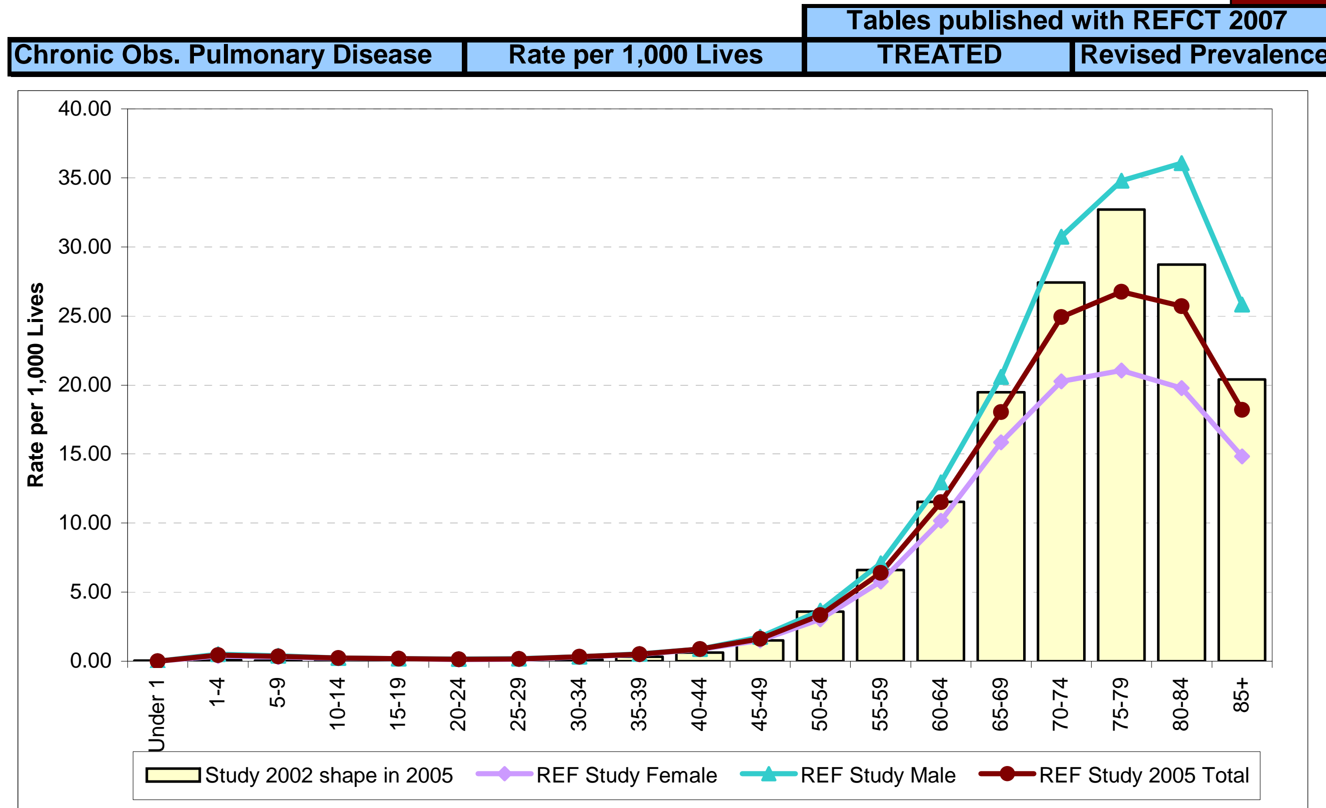


Predominantly male in childhood, female in adult years.

Source: REF Study 2005

COPD Prevalence

TREATED Verified

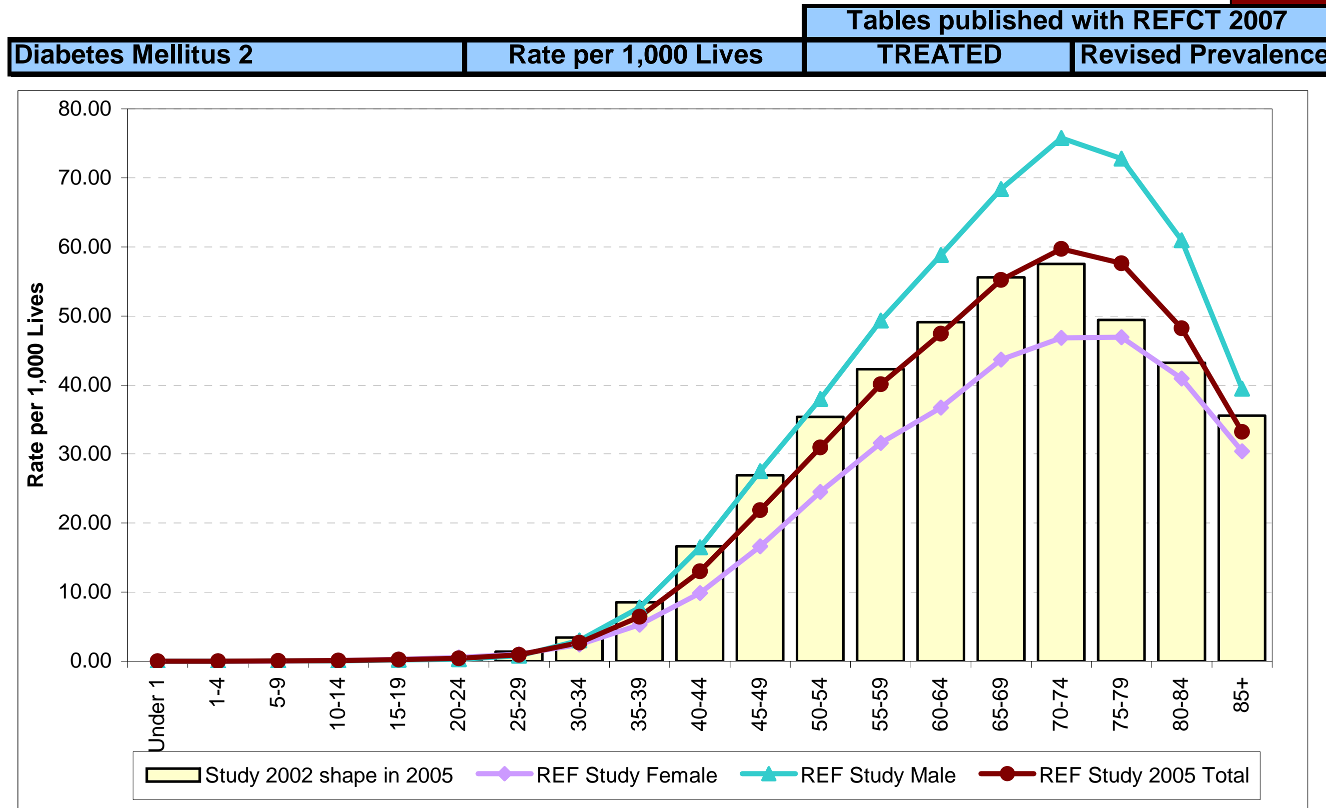


Late onset. Predominantly male.

Source: REF Study 2005

Diabetes Type 2 Prevalence

TREATED Verified



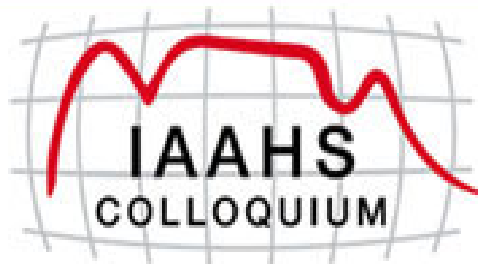
Similar to previous levels. Predominantly male.

Source: REF Study 2005

Advice on Developing a Risk Equalisation System

- Obtain clear objectives for the healthcare system and RE
- Define and price a common benefit package
- Choose broad methodology and check economic impact
- Set criteria for risk factors
- Research and determine impact of risk factors
- Determine formula
- Peer review: local and international
- Implementation issues: governance, accounting, timing, data flows, money flows, legislation, politics …

- **Consult, consult, consult**



International Actuarial Association Health Section
2007 Colloquium

13th - 16th May 2007 Cape Town, South Africa

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